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Restructural Information System Change

A Case Study in the Context of Local Government

A DISSERTATION

presented to

THE DEPARTMENT OF INFORMATION SYSTEMS

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MASTERS OF COMMERCE DEGREE

IN

INFORMATION SYSTEMS

by

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06 June 2000

Ver 6.10

Acknowledgement and Declaration

1. The information presented in this dissertation is not confidential.
2. I certify that this dissertation is all my own work and that all references have been acknowledged.

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06 June 2000

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SYNOPSIS

Change affects all components of the social institution referred to as an organisation. Change can be initiated or is caused by either internal or external triggers. These triggers cause change to various aspects of the organisation. This includes changes to the organisational structure, the culture of the organisation and finally the systems of the organisation.

The focus of this research is on change to systems, with systems being defined as a logical grouping of specific elements in the organisation which work collectively to achieve a common intent. A system can be computerised or manual, a computerised system is generally referred to as an Information System(IS).

The research is thus further refined to observe change with respect to information systems. Change to an information system, within an organisation, can range from being relatively minor to catastrophic depending on the event or trigger which caused the change. The range of IS change can be categorised into different classes. The first class of change is maintenance which results from a relatively low impact trigger. The next class is new development, followed by tactical change, business process re-engineering to disaster recovery which is considered the most catastrophic change and is caused by a high impact trigger.

These different classes of change can be placed in a framework against which different characteristics defining these classes are identified. Using the framework a gap has been observed between the BPR and Disaster classes. This gap could possibly be filled with a proposed IS System change class named "Restructural Change".

Restructural change is defined as a class of IS change which is triggered by an event that transforms or radically alters the organisation. To scope this concept, the event which triggers this change would result in more than a BPR exercise and less than a full disaster situation.

By looking at the various characteristics that define an Information System Change Class current literature seems to indicate that Restructural Change is in fact a distinct class of information system change.

To test the hypothesis that Restructural Change is a unique category of change and that this type of change would need a different implementation method a case study was embarked upon. The case study selected was in a local government context. This local government organisation had been amalgamated with two other similar organisations and as a result their respective billing information systems had to follow suit.

A detailed study of this change situation was examined and interpreted in the context of the various characteristics that would define the change to the informational systems as being “Restructural”.

The findings suggest that Restructural Change is a valid IS change concept. An initial IS Change Framework was specified as part of the literature review. There were some amendments to the initial framework which resulted from the case study. The reasons for these were explained and documented in the body of the case study resulting in a refined framework.

It was noted during the case study that the development technique required for Restructural Change differed to that of other classes and was contrasted to the traditional System Development Life Cycle.

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LIST OF ABBREVIATIONS

CASE	Computer Aided Software Engineering
CCT	City of Cape Town
CEO	Chief Executive Officer
CMC	Cape Metropolitan Council
DBMS	Data Base Management System
DG	Data General
DITS	Directorate of Information Technology Services
ID	IDentity
IS	Information Systems
IT	Information Technology
JAD	Joint Application Design
JSE	Johannesburg Stock Exchange
OSI	Open Systems Interface
PC	Personal Computer
PID	Project Initiation Document
PRINCE	PRojects IN Controlled Environments
RDBMS	Relational Data Base Management System
SDLC	System Development Life Cycle
SQL	Structured Query Language
TB	Tera-Byte

CHAPTER 1 : THEORY

The purpose of this paper is to present a dissertation which introduces the broad subject area of Information System (IS) Change, and to introduce a more specific sub-area of change referred to as “Restructural Change”. As part of this research, a literature review is provided in order to identify the mainstream of academic and professional thinking relating to the IS change topic. The review is used to develop a basis for the qualitative field research phase of the masters dissertation project. The literature review will be used to fully develop the research question, as presented as part of this masters proposal, to be addressed in the research itself.

The basis for the field research phase of the project will consist of : (a) a theoretical framework developed from the literature review and prior research, that provides a structure for the observations and data processing to be carried out in the field research, together with (b) a strategy of a qualitative research approach to be employed in formulating and testing the hypotheses that are intended to contribute towards answering the research question.

The qualitative research strategy will be one that is appropriate for examining the IS relationships and changes within local government organisations.

1.1 CONTEXT AND HISTORY

This research attempts to establish a logical relationship between the triggers that cause changes to an organisation and how these changes are interpreted or implemented with respect to the various systems of that “changed” organisation.

Organisational change as a concept has been in existence for some time and there is a fair amount of mainstream literature on the topic. Indications are that this theory originated from established Organisation and Methods concepts of the late sixties and early seventies.

Using various organisational change concepts as defined by contemporary authors such as Sadler, Senior and Web the concept of an organisation is authenticated and various types of events, both internal and external, that cause change are used to provide an overall context for organisational change.

Once the concept of organisational change is established the research then observes how change affects various aspects of the organisation. There is some consensus, among the contemporary authors, that the major components of an organisation can be defined in terms of the organisation's culture, organisation's structure and the systems of the organisation. The culture and structure of an organisation are as important components as that of the systems and are no less affected by change. However, in an attempt to place this research in a more manageable context only organisational changes that have a direct influence on the organisational systems will be examined, more specifically the information or computer based systems will be observed.

In order for the change in computerised systems to be studied, the concept of an information system is established during the literature review. Definitions are extrapolated from various systems theorists such as Silver & Silver, Laudon & Laudon and Licker. Once the concept of an Information System has been established, discussion takes place on the manner of implementing change to the information systems. A generalised set of change classes are established using the current literature as a basis for establishing the set. The initial set of change classes are as follows;

- (i) Maintenance
- (ii) New Development
- (iii) Tactical Change such as out-sourcing or spin off of the IT department
- (iv) Business Process Re-engineering
- (v) Disaster/Catastrophe Recovery

A set of defining characteristics or antecedents are also derived from current topical literature to uniquely identify each class of system change and an Information System Change Framework is presented. This framework is used to corroborate different types of system changes against a generalised class.

In summary the context of this research is to determine how organisational changes affect the information systems of those organisations and the classification thereof.

1.2 RESEARCH TOPIC

In order to shape the dissertation, an interim research question has been posed; “What are the scope and limitations of the current IS change definitions and concepts as a response to the informational requirements of organisations going through highly significant types or magnitudes of change.” IS change, in this context, can be defined as the changes to the information system, events and interfaces that are applied to a particular (or a set of) information systems.

The research and literature survey have been framed by the following :

The broad subject areas to be studied are the management fields of organisational change and information system changes such as maintenance, development, Business Process Re-engineering (BPR) etc. As a point of departure, a newly introduced sub-area Restructural Change is initially defined as a profound, externally induced, not necessarily motivated by profit or business improvement (eg. politically) motivated change.

The essence of the research project will focus firstly on the definition of organisational change and how such a change affects the information systems of an organisation. Secondly, to identify the different types or classes of information system change and identify a set of distinguishing characteristics for each of these IS change classes. These classes and characteristics will then be placed in an information system change framework.

Finally to introduce a new class of change and compare this class using the previously identified characteristics of IS change. The new class of change, once established, can then be placed in the framework to develop further the concepts of an information system change framework.

Once defined from a literary or academic perspective, the research then aims to test this new class of change by using a Case Study. The Case Study selected will be a recently completed project set in the context of a South African local government environment.

1.3 CONTENDING THEORIES

The importance of information in most organisations is escalating dramatically and according to Davis *et al* (1994, 165 - 170) the next wave of economic growth is going to come from knowledge-based businesses. Changing technology is driving this next wave of economic growth, and in order to take advantage of that growth, organisations will have to apply not only new technology, but also new methods of system development approaches, so as to accommodate the implementation of this new technology. One example of a new approach to development, to be explored further as part of this research, is how we change information systems to adapt to profound changes in business environment.

In his article '*Re-engineering the Organisation Using Information Technology*' Schnitt (1993) discusses the perception that IT organisations focus mainly on how technology is used and not what it is used for. He continues with the assertion that the overall aim of systems development is to solve existing problems and improve current processes and procedures. With this in mind there seems to be a gap in current IS development procedures and methods that do not cater for organisations which have been structurally transformed. This transformation could result from a merger, a total organisation restructure or any other high impact change.

There are a number of contending theories with regard to organisational change and the internal and external triggers that are associated with such change. These are discussed in the literature review to follow.

A profusion of theories exist with regard to individual classes of information system change. These range from those supplied by Swanson & Beath in respect of Maintenance and New Development to those supplied by authors such as Davenport and Hammer on Business Process Re-engineering.

The state of the theory in the various areas is generally vigorous with each major set of theories well documented. However, the IS change framework as presented as part of this research is unique and little or no specific theory could be discovered for the concept of Restructural Change.

This research reinforces much of the current knowledge on IS change methods. However, further attempts to derive a logical relationship between the organisational change and the approach needed to implement that change to the information systems of a given organisation have not been well researched. There does seem to be an area in organisational change namely mergers, unbundling and other large scale restructuring changes where the exact method to implement the system change is not well chronicled.

1.4 NECESSITY FOR RESEARCH

The necessity for the research is reflected by the need for organisations to be more globally competitive. There are a myriad of popular press articles that demonstrate the fact that global competitiveness is often achieved by organisations merging, amalgamating, unbundling or undergoing other high impact restructuring processes. This type of organisational change is well documented with many famous examples quoted. It should also be noted that there has been a fair amount of research presented, as part of other non-technology related sciences, in integrating organisational cultures and structures after such an organisational change.

This research focuses on the computer systems of organisations that have merged or restructured. Further, it places the merged organisations in a position where they have to combine similar, yet previously autonomous systems to provide the same functionality for the newly established organisation.

This concept can best be demonstrated by means of a generic example. Assume Organisation A merges with Organisation B to form newly created Organisation C. Both organisations have their own payroll, stock and ordering systems. A management decision is made, during the merger, to have a single set of information systems using the best systems from each organisation and migrating the data from the non-selected systems.

This research aims to provide a mechanism for firstly selecting the most appropriate system and secondly providing a method for combining the data and functionality of the respective systems to form a new set of information systems. Using the above example it follows the newly created Organisation C's information system set could consist of the following :

Organisation A's Payroll System with Organisation B's data migrated.

Organisation B's Stock System with Organisation A's data migrated.

Organisation A's Ordering System with Organisation B's data migrated.

The above example is a simplistic description of two organisations going through a Restructural Change and highlights how the different information systems of those previously autonomous organisations have to be combined or amalgamated. The theory for this change and an examination of different approaches is discussed as part of this research.

1.5 VALUE OF RESEARCH

The value of the research is essentially an attempt to provide a more scientific means of effecting the information system change (referred to as Restructural Change) in organisations undergoing a merger or any complex organisational change where duplicated functional systems may occur.

1.6 THE RESEARCH HYPOTHESES

The following initial working hypotheses are proposed for this research :

- A framework for Information System Change can be created which characterises different classes of Information System Change
- Assuming there are currently a number of different classes of Information System change, a further unique category Restructural Change can be added.
- Typical development methods or approaches, which are currently used and deemed appropriate for conventional IS change are inadequate for implementing Restructural changes in an organisation.

1.7 OVERVIEW OF THE REST OF PAPER

To clarify the remaining chapters in this paper a brief discussion of each chapter is provided below :

CHAPTER 2 : LITERATURE REVIEW

This chapter provides an academic grounding for this research by defining concepts related to the definition of information system change and introducing the concept of Restructural Change.

Information system change originated, in this research, from concepts derived from an overall definition of organisational change. The concept of an information system within the organisation is established and different types of information system change are delineated during the review.

A theoretical Information System Change Framework is then established in this chapter.

The concept of Restructural change is introduced by supplying a definition and business case for the Restructural Change concept. Finally, a discussion on where Restructural change fits into the IS Change Framework concludes the literature review.

CHAPTER 3 : METHODOLOGY

This chapter follows on from the literature review by attempting to define more detailed research questions introduced by the review and that can be proved or disproved during the case study component of the research.

This chapter also outlines the general qualitative approach used in the research as well as describing the data collection methods. This chapter further explains the authors involvement in the case study as well as why this case study was selected to be studied.

CHAPTER 4 : OUTLINE OF CASE STUDY

This chapter provides a detailed account of the selected case study. It starts by describing the motivation for change in South African local government and more specifically in the Western Cape region.

The case study then describes the City of Cape Town's computer strategy and current infrastructure, followed by the background and motivation for this particular project known as the New Billing Project. The New Billing Project is described in terms of its initiation, scope, objectives, organisation and deliverables. A more detailed study of the major Restructural Stage, Stage 4, is also narrated.

CHAPTER 5 : FINDINGS

The findings of the case study are provided in this chapter. These findings are presented in the context of confirming the IS Change Framework. As a result of the case study some amendments are made to the framework and are then incorporated into the Final Information System Change Framework which is discussed in detail.

Further, in this chapter the development techniques that can be used for Restructural Change are examined and compared to those of more traditional IS change concepts.

This chapter also annotates various limitation of this study as well as points out possible areas of future research.

CHAPTER 6 : CONCLUSION

The chapter concludes the overall research by reviewing what was established during the literature review and how this was proved or disproved during the case study.

CHAPTER 7 : REFERENCES

A comprehensive list of references is supplied which substantiate various concepts or theories produced by this research.

In summary, this chapter has briefly introduced an area of study referred to as IS change. A question has been asked, regarding the ability of current IS development methods to implement a specific type of IS change. This change has been referred to as Restructural Change and is characterised by the fact that it is highly significant and is generally not motivated by short term profit or business improvement. The next chapter of the research will define the concept of change by firstly looking at it in an organisational context and then more specifically in terms of an information systems context.

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CHAPTER 2 : LITERATURE REVIEW

2.1 INTRODUCTION

The literature review introduces and provides theoretical background for various concepts that support or assist in defining the overall topic of “Information System Restructural Change”.

The review starts by critically reviewing and making a summarised analysis from modern literature on the topic of IS Change. The first step in this process is to provide an understanding of the notion of change by looking at it from an organisational change perspective. Once a reasonable definition of change has been defined the next concept to be expanded upon is that of information systems.

On completion of the academic definition of change and information systems the two are synthesised to provide an explanation of IS Change. A high level model is presented on how these two components interact.

This idea (of IS and Change interaction) is further endorsed by attempting to provide a generalised list of the different types or ways a set of information systems can change. Each of these classes of IS change is described and the different attributes that make them a distinct class are discussed.

Further, a framework is created which lists each class and the various characteristics and/or antecedents that distinguish each class entry.

Once the IS change framework has been established, the literature review then puts forward the possibility that a new type of IS change could exist. A literal foundation for this new type of IS change is discussed and the concept is introduced as Restructural Change.

The scope and business case for Restructural Change is discussed at some length using the academic literature as a basis for the introduction of the concept. The final section of the literature review discusses how Restructural Change fits into the previously established Information System Change Framework and whether or not this topic can be viewed as a separate class of information system change.

The literature review ends with certain conclusions and describes how these conclusions can be justified by the next chapters of the dissertation, which describe the selected case study.

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2.2 DEFINITION OF INFORMATION SYSTEM CHANGE

2.2.1 Outline of change by agreeing definition of organisational change

The purpose of this section is to briefly review the research on organisational change. Further, to place this topic in context with respect to applying the definitions and underlying philosophies to a more specific area of change, being the change to organisational systems. The section will start by defining the concept of an organisation followed by describing how and why an organisation can change. Finally a standard model of events that can cause a change is then presented.

The concept of an organisation is generally taken for granted and in most literature is generally associated with concepts such as a business, enterprise, company or government institution. However, a more formal and descriptive definition is offered by Sadler (1998, 3) as being “Organisations are social institutions. They consist of groupings of people whose activities are directed towards the achievement of a common purpose.” This term, continues Sadler (1996, 50), is used to distinguish more formal groups from other, less formal, social groupings such as crowds, communities, age groups or social classes.

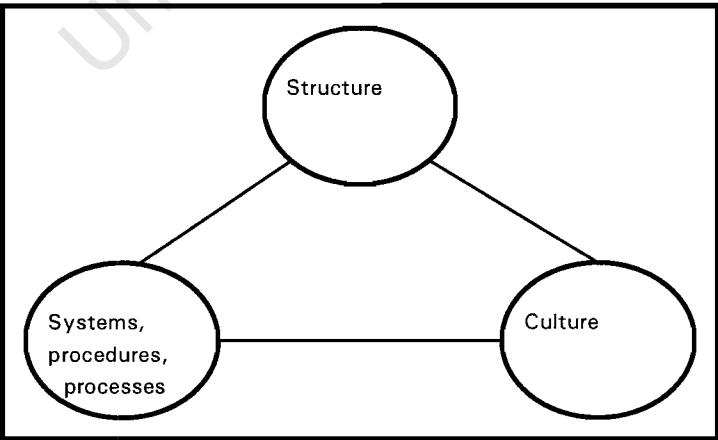


Figure 1 : The components of an Organisation Source Sadler (1998)

Sadler (1996, 32 - 45) presents three major components to the organisation composition, (see Figure 1). These components are *structure*, *culture* and *systems* (which include procedures and processes). The structure component deals with level of authority that defines the hierarchy of the organisation. The structure, often depending on the organisation, can be of different types for example hierarchical, flat etc. Culture, the second component, is more difficult to define but essentially covers the shared values or the common mind set of the people working for that organisation. Although important in the context of organisational change the first two components will not be reviewed in detail as part of this research. The main reason for this is that these two components are fairly distinct fields of study in their own right and examining them in detail would detract from the main area of research, the “system” component.

As mentioned above this particular research will focus on change to the “system” component of the organisation. The concept of change and system will be clearly defined in the following paragraphs.

In order to establish a reasonable definition of “change” in the context of organisational systems, reference will be made to the extensive research in the general field of organisational change. Contemporary authors on this subject such as Sadler (1996), Webb (1994), Senior (1997) and Sadler (1998) subscribe to the view that change, to an organisation, can take many forms and often comes from many different directions or is caused by one or a number of different *triggers*.

Saddler (1998, 128 - 132) states that the term “trigger” can be defined as the event or logical set of events that caused the change to take place within an organisation. From the literature presented it is clear that the term “trigger” is a synonym for the word “cause”.

Senior (1997, 14 - 18) proposes that change experienced by an organisation can be ascribed to both internal (within the organisation) and external (outside of the organisation) forces or events, ie. internal and external triggers.

For descriptive reference purposes a list of external change triggers have been established and documented in Table 1, and is supported by the above mentioned contemporary authors on this subject.

Senior (1997), supported by Sadler (1996), have split the external triggers into four main groups, each with a number of events that could cause a change to an organisation. The groups include political changes, economic changes, socio-cultural changes and technological changes. This list, (as provided in Table 1) although not exhaustive, does provide a useful list of what constitutes an external trigger of change in an organisation.

POLITICAL	ECONOMIC
<ul style="list-style-type: none"> ☞ Government Legislation ☞ Government Ideology ☞ International Law ☞ Universal Rights ☞ Wars ☞ Local Regulations ☞ Taxation ☞ Trade Union Activities 	<ul style="list-style-type: none"> ☞ Competitors ☞ Suppliers ☞ Currency exchange rates ☞ Employment rates ☞ Wage rates ☞ Government economic policies ☞ Other country economic policies ☞ Lending policies of financial institutions ☞ Changes from public to private ownership
SOCIO-CULTURAL FACTORS	TECHNOLOGICAL FACTORS
<ul style="list-style-type: none"> ☞ Demographic trends ☞ Lifestyle changes ☞ Skill availability ☞ Attitudes to work and employment ☞ Attitude to minority groups ☞ Gender issues ☞ Willingness and ability to move ☞ Concern for the environment ☞ Business ethics 	<ul style="list-style-type: none"> ☞ Information Technology / the Internet ☞ New production process ☞ Computerisation of processes ☞ Changes in transport technology

Table 1 : Set of examples of External Triggers - Senior (1997), supported by Sadler (1996)

A second type of trigger, an internal trigger, is defined by Senior (1997, 10 - 30) as a factor within the organisation that precipitates change. A list of examples of internal triggers is provided in Table 2.










SUBSET OF INTERNAL TRIGGERS	
	An organisation being unionised
	New Chief Executive Officer or other senior manager
	Revision of administration structures
	Re-design of a group of jobs
	Re-design of a factory / office layout
	Purchase of new IT equipment
	A new marketing strategy
	A cut in overtime working
	Staff redundancies

Table 2 : Set of examples of Internal Triggers - Senior (1997), supported by Sadler (1996)

In conclusion, one or more of these triggers, either external or internal could cause a “change” to an organisation. This change would, in turn affect one or more components of the organisation. To accommodate the specific change, amendments would have to be made to the organisation structure, the culture of the organisation may have to change, or the systems, procedures or processes of the organisation would also have to be amended. This interdependence is demonstrated in Figure 1 and will be dealt with in more detail in the remaining sections of the review.

The correct management of the change to each component Structure, Culture and Systems, of the organisation is vital. The focus of this literature review however, will be on the affect of change with respect to the organisational systems (this concept will be dealt with in detail in the remaining sections). It is acknowledged in this dissertation that the change to the culture and structure of the organisation is important but to dwell on the remaining two components would force the review outside of the scope presented by the proposal.

2.2.2 Information Systems within the Organisation

The previous section established the concept of an organisation and listed the systems of the organisation as being one of the major elements, or what was termed components, that make up an organisation. The purpose of this section is to define the relationship between an organisation and the information-based systems used by that organisation.

The section will firstly provide a detailed definition of the term “information system” and then show how information systems are placed, in terms of development and usage, in the context of an organisation. The section will conclude by attempting to draw logical conclusions, based on the available literature, that there is a distinct relationship between organisational change as defined above and information system change which will form the focus of the remainder of the literature review.

Licker (1997, 48) provides a generic definition of a system as being “a collection of elements (things, procedures, people) that interact in order to meet a goal”. Expanding on this definition, each of the elements relate to each other by means of an explicit or implicit relationship. A single predefined (or bounded) set of elements and their relationships form the system and each system interacts with its environment. The environment is made up of other elements possibly from other distinct systems. This definition of a system is supported by Silver & Silver (1989, 4 - 6) who point out that each entry to or exit from a system boundary is an input or output to the system.

From Licker’s generic definition of a system the concept of a “computer based information system” as presented Laudon and Laudon (1991, 5) is a system that has data (information) as one of the major elements. An overall definition of an information system is provided by Silver and Silver (1989, 4 - 6) as being “collections of procedures, programs, equipment, and methods that process data and make it available to management for decision making”. This is a high level, non specific discussion of an information system, however it will be further refined and placed into an organisational context later in the chapter.

Since the first electronic information systems of the 1950's there has been an exponential growth of dependence of organisations on information systems with many organisations viewing their information systems as a strategic component of their respective organisations. The integration of information systems into the business strategies, rules and procedures has led to these information systems becoming an “institutional core” of the modern business (Laudon & Laudon (1991,10 -15)).

Both Frenzel (1992,6 - 8) and Laudon & Laudon (1991,38 - 43) subscribe to the view that information systems can now be considered prolific within the typical modern large organisation. The functionality of various systems may differ depending on where and for what purpose they are used in the organisation. The usage ranges from transaction processing systems, used at the most basic operational area in the organisation, to management information systems which are used to make strategic decisions.

The Laudon & Laudon (1991, 40) framework for defining types of information systems, from the most basic data intensive systems to the more complex aggregated decision support systems, each relate to certain characteristics of the input, output and users of the set of system types. This has been provided to establish the range of information systems within an organisation.

This initial framework, shown as Table 3 below, of different types of information systems against possible input and output is used to illustrate the spectrum of information system types and users that occur within a typical organisation.

By combining the Laudon & Laudon framework with the Gory & Scott-Morton traditional organisation management hierarchy as interpreted by Frenzel (1992, 6 - 8), one can depict the range of system types and at what level within the organisation they are used or are affected by the information system. The overall concepts recorded in this merged framework (Table 3) is supported by Erlank (1997,16 - 20) who uses Anthony's model for depicting organisations as a pyramid representing different levels of operations and management.

Class of IS	Information Inputs	Information Outputs	Users/Level
Executive Support Systems	Aggregate data; external, internal	Projections; response to queries	Strategic, senior managers
Decision Support Systems	Low-volume data; analytical models	Special reports; decision analyses	Tactical, middle managers
Management Information Systems	Summary transaction data; high volume data; simple models	Summary and exception reports	Tactical, middle managers
Knowledge Worker Systems	Modelling, simulations	Models, graphics	Operational, professionals
Office Automation Systems	Document management Scheduling, communication	Documents, schedules, mail	Used at all levels
Transaction Processing Systems	Sorting, listing, merging, updating	Detailed reports; lists summaries	Operational, clerical

Table 3 : A Framework Depicting the types of IS in a typical organisation

An organisational change as defined in Section 2.2.1 of this literature review could have an affect on one, some or all of the information systems types within an organisation. In order to clearly demonstrate the relationship between organisational change and the information system component of an organisation the following summarised case study is presented as an example of the above mentioned relationship between organisational change and systems change.

The Cape Town Municipal Pension Fund (CTMPF) is a local government organisation which has been in existence since January 1924. The primary function of this organisation is to manage the contributions toward, and eventual provision of a Defined Benefit pension to staff who work at the Cape Town City Council (CCC).

Between 1994 and 1997 there were important changes in local government legislation. This, coupled with union demands calling for certain fundamental changes, led to extraordinary organisational changes to the CTMPF, the likes which had not been seen in the entire history of the fund.

The fund experienced a number of organisational changes. For the sake of brevity only three major changes will be discussed :

- (i) By introducing freedom of association CCC employees no longer had to belong to the CTMPF. The fund was now for the first time a competitive organisation with no captive market.
- (ii) The pension administration procedure changed from a Defined Benefit approach to allow for a Defined Contribution calculation of pension benefit management. For the sake of this example, a Defined Contribution is a different way of managing the investment and benefit of a pension and is fundamentally different to a Defined Benefit pension.
- (iii) Reduce pensionable age from 65 to 60 allowing employees of the CCC to retire five years earlier.

In respect of the first change, in terms of the three organisational components, it was evident that in order for the CTMPF to become a competitive entity, the structure and system components could stay intact but the culture component of the organisation would have to change. The change in culture change would be from a monopoly service rendering institution to a competitive, more client attracting independent organisation.

The second organisational change however, affected the way in which pension benefits were calculated and as a result had a direct impact on the systems component. The information systems of the fund had to change to cater for the new pension (Defined Contribution) approach. Further, staffing and structural changes had to be made to cater for this new pension approach. Finally there was limited cultural change in providing clients with two possible pension options, something that had not happened in the past.

The third organisational change resulted in a change to the system component only, in that the administration systems had to be amended to cater for the new pensionable age.

Although summarised, this actual example clearly shows that an organisational change can affect some or all of the organisational components. This literature review will focus mainly on organisational changes that affect the systems component of an organisation

The type of change (how the information system will be changed) is further discussed in the next section of this review. The section will demonstrate the different ways an information system in each of the IS classes (defined in Table 3) will be changed.

In conclusion, for the purposes of this research it should be noted that a true organisational change could lead to an information system change(s) that could affect one, some or all of the above classes of information systems. How this change is implemented will be discussed in the next section.

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2.2.3 Information System Change

From the above section it can be concluded that change to an organisation can cause changes to the information systems within an organisation. The focus of this section is to provide an initial framework for the set of different types of information system changes that can take place within an organisation. Further, for each different type, an attempt is made to differentiate between them by defining a set of characteristics for each type of system change.

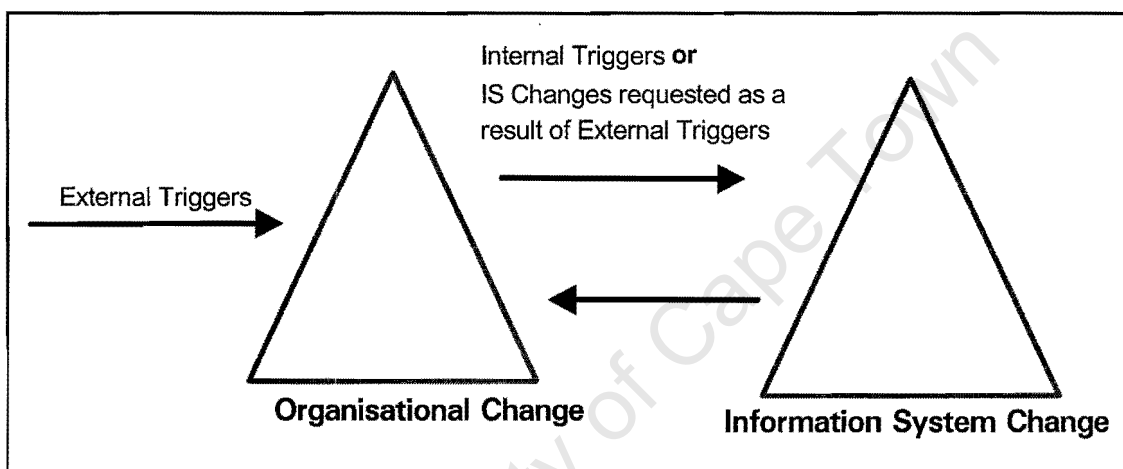


Figure 2 : Graphical representation of the relationship between organisational change and IS change

Figure 2 is a simplistic diagrammatic view of what has been demonstrated during the preceding sections, that any change to the organisation would have an affect on one or more information system(s). The remainder of this section will show how the different types of information system change can affect the organisation.

Lay *et al* (1993,18) define that relationship between organisations and information systems by stating that “information systems play a vital role in organisations” and further contend that their organisation and structure are inextricably linked to the enterprise or organisation they serve. Following the thinking of Lay *et al* information systems are created to serve a particular need within the organisation and as such any change to the organisation invariably could lead to some degree of change to the information system.

The following list is a summary of current information technology literature on the major possible type of change that one or more information systems can encounter. The author acknowledges that this list is not completely exhaustive however, these are generalised categories which are aimed to group or categorise various types of IS change. Each group or category is explained by literature review summaries and the outlining of their main characteristics which delineates each category below :

- (i) Maintenance
- (ii) New Development
- (iii) Tactical Change such as outsourcing or spin-off of IT department
- (iv) Business Process Re-engineering
- (v) Disaster/Catastrophe Recovery

The above list is generic set of system change types and it should be noted that there are a myriad of different technologies that can be incorporated into each of these system change types. The provided list of change types however, is exhaustive and has been validated by contemporary IS authors and current IS professionals.

(i)(ii) **Maintenance and New Development**

Maintenance and New Development are best explained by clearly differentiating between the two concepts. At the lowest simplistic level “development” means the creation of a new system whereas “maintenance” generally means the amending or repairing of an existing system. Swanson and Beath (1989, 293 - 300) support this notion by stating that “development is generally understood in the IS literature to refer to the analysis, design and implementation of new applications. Maintenance on the other hand, has been defined to include corrective, adaptive and perfective modifications to installed systems”.

In practice the “adaptive” and “perfective” are normally grouped together and these enhancements are distinguished from fixes or program error correction (Swanson and Beath 1989, 298 - 300).

Swanson and Beath further point out that the boundary between maintenance and new development is not fixed and that often enhancements are of such nature due to complexity or size that they transcend into new developments.

For the purpose of this research, “maintenance” should be viewed as enhancements or amendments to existing system functionality; and “development”, the creation of a new system functionality thus establishing a new or entirely different information system.

With respect to the system change concept Lay *et al* (1993, 17 - 21) explain that a new system is developed to meet a set of related needs or requirements of an organisation. It is not explicit in the literature that the need or requirement is stimulated by an external change but one, using practical experience, can deduce that a change to an organisation could present a requirement or a need for new development. This is clearly demonstrated in the Pension fund example where the organisational change calling for a new Defined Contribution pension approach resulted in new systems being developed.

The system change for a maintenance item is generally less pronounced as it merely alters a system already in existence. This too, it can be deduced, could be initiated as a result of some change to an organisation. Again this is clearly demonstrated in the Pension Fund example where the systems had to be maintained to cater for the change in pensionable age.

There are a number of different ways and technologies that can be used to develop and maintain systems, each of these types of development or maintenance are not to be confused with the fact that they all fit into the generalised system change category of system development or system maintenance. An overview of systems development past, present and future is provided by Wang (1997, 191 - 200) where the development technology from

COBOL to CASE and object orientation is outlined. It must be stressed that these development technologies are different ways to develop or maintain an information system and are not classes of information system change as per the definitions provided as part of this research.

(iii) **Tactical Change**

In the current literature tactical change seems more of a business management concept than a change to information systems. It has been described by Lay *et al* (1993,17 - 21) as being the area of the organisation where “managers are responsible for control and tactical planning ie. how things should be done.” This definition has been extended to information system change. A change to how systems are created, maintained and pervaded throughout the organisation is classed as a “Tactical Change” rather than a change to the systems themselves.

Here are two practical examples of the concept. The first is a tactical change from an “in-house” Information Technology (IT) responsibility to an outsourced IT responsibility. The tactical change is the use of a different set or sets of people to undertake IT functions. This change of tactic could have emanated from a change to the organisation.

Another example of tactical change is the creation of profit centres for IT departments. This represents a change from being a service centre to a profit centre. A profit centre is distinct from a service centre in that the profit-centric IT department must be viewed as a business unit which produces and maintains systems with the view to making a profit and contributing to the organisation’s operating profit. A service-centric IT department is viewed as a support function which is considered by the organisation as an overhead.

Tactical changes are different to new development and maintenance changes in that they generally affect all aspects of the IT division within an organisation.

The following is a list of further examples of tactical change :

- ❶ Adopting a new system development methodology
- ❷ Migrating from mainframe to client server computing
- ❸ Migrating from client server to Internet based applications
- ❹ Rehiring IS staff as contractors
- ❺ Allowing IS staff to work from home
- ❻ Adding or removing a particular IT department eg. Mainframe operator support

Although not exhaustive this list attempts to define what represents a “tactical change”.

(iv) **Business Processes Re-engineering**

Business process Re-engineering (BPR) is a well publicised concept which garnered a large amount of exposure in management literature during the early nineties. This copious BPR literature, according to Davenport & Stoddard (1994, 121), created an almost mythical view of the concept as well as its surrounding technologies and methods.

A reasonable definition of BPR is however provided by Davenport & Stoddard (1994, 122) as “a powerful change approach that can bring about radical improvements in business processes”. Although accurate, this definition is also tinged with hype in itself.

By analysing the above definition and reducing the hype a more impartial definition would be; that BPR is a means of effecting change in a business by redesigning some or all of the processes (including information based processes) of that organisation.

This concept is supported by Licker (1997, 66) who claims “BPR challenges the assumptions upon which business processes and the resulting organisation and information systems are built.” This is further supported by Callon (1997, 312-316) who explains that BPR identifies

the fact that there should be a recognition of the importance of business processes and a focus on their total improvement.

Extending the above definitions it can be said that if the business processes change then the supporting information system(s) and possibly their management would have to be redesigned and changed (re-engineered). This change differs from other types of system change in that the focus of change is on the underlying business processes and not on individual information systems or separate business needs.

These concepts are well underlined in Hammer's now famous article on BPR entitled "Re-engineering Work : Don't Automate, Obliterate" published in the *Harvard Business Review* of 1990.

(v) **Disaster/Catastrophe Recovery**

The final class of IS system change is defined as the IS change needed by an organisation in the event of a disaster.

Amm (1998, 1) defines the term "disaster", as being "a single or multiple events of destruction and/or equipment failure that renders the organisations business environment inoperable".

Amm further underlines that the IS change needed for the continuing of the organisations business functions during and after a declared disaster has occurred is termed as "Computer Disaster Recovery".

The IS change needed to facilitate Computer Disaster Recovery is more than just recovery of computers; there are a host of other factors which need to be considered within the scenario of a computer breakdown. Amm (1998) outlines some examples being the provision of stand-by computer facilities and staff allocated to work on them. Cognisance also needs to be made of

the various peripheral manual services which could have been affected by the same disaster. Less tangible assets should also be preserved during times of stress, such as public relations, management control or members’ confidence in the organisation’s ability to continue to function.

This type of IS change is different to the other classes of change in that, the requirements are not predefined, meaning that the extent of the disaster cannot be measured before it happens. Further, the timescales for such an event cannot be planned and budgeted for unlike the other classes. These factors lead to the assumption that Disaster Recovery is an IS change class in its own right.

The five classes or categories of change defined above are different ways of changing the (or set there of) information systems of an organisation. These changes, as reflected in figure 3, to the information system(s) also have an impact on the organisation.

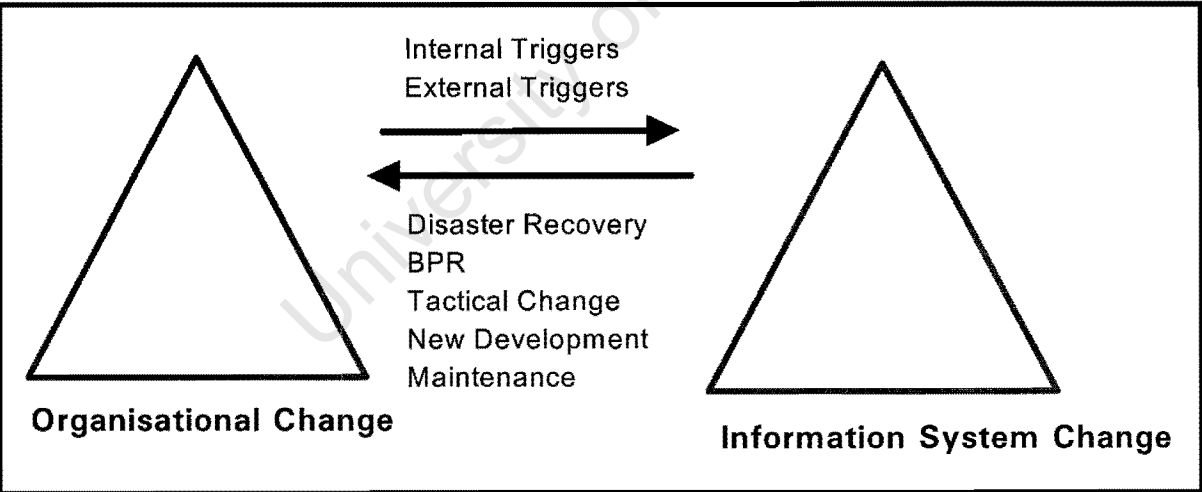


Figure 3 : Organisation Change and IS Change

Figure 3, therefore represents the fact that changes are brought about by internal or external triggers. These changes affect the information systems which manage this system change by using one or more of the “system change classes” as defined by the set : Disaster Recovery, BPR, Tactical Change, New Development or System Maintenance.

Each of these IS change classes is a distinct category of systems change. What makes them unique are different IS characteristics. A set of IS characteristics has been identified in the next section and these are applied to each of the classes by applying them to a framework.

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2.2.4 Development of an Information System Change Framework

The above literature provided a source of information, with regard to the set of information system change classes, which can be further interpreted to construct an initial Information System Change Framework. This framework of information system change can be used firstly to confirm the IS change set identified by studying the literature. Secondly, it allows each member of the set to be categorised and differentiated by specific characteristics and/or antecedents.

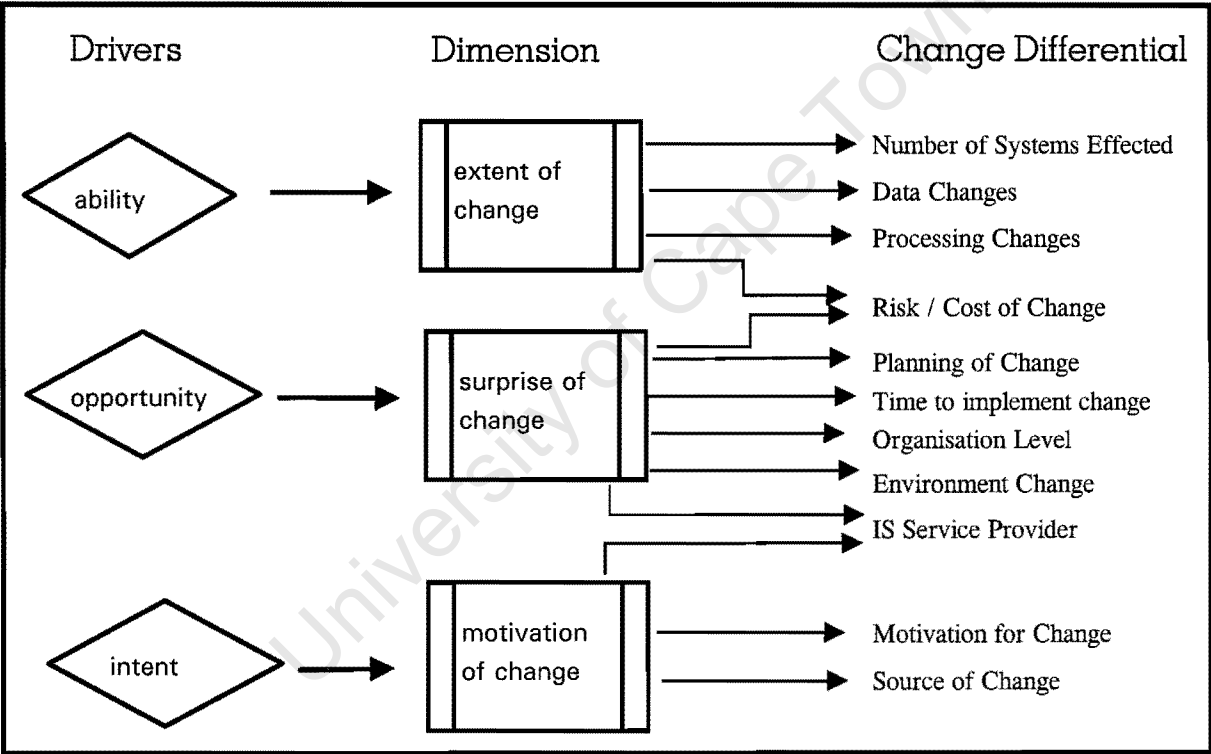


Figure 4 : Derivation of Change Differentials

As shown in Figure 4 the set of Restructural Change differentials or characteristics is derived from three major drivers namely; the ability to change, the opportunity for change and the intent for information system change. Each of these drivers acts on a specific dimension of change; extent of change, surprise of change and motivation of change. As a result of the different drivers acting on each dimension a set of change characteristics or differentials has been identified from the current literature on IS change.

The three major drivers of IS Change; ability, opportunity and intent are used to identify the key reasons for changing an information system(s). Each driver acts on a particular dimension which is in turn characterised by a number of change differentials. A brief discussion on the drivers and relevant dimensions is provided below followed by supporting explanation of each individual change differential.

(i) *Ability*

The generalised IS change driver referred to as the *ability* to change acts on the change dimension *extent of change*. This driver and dimension examines the capability of an information system(s) to change and what affect this change has on the information system(s). This dimension of change is characterised by the number of systems effected by the change, the changes made to the system's data and the changes made to the system's processing.

(ii) *Opportunity*

The generalised IS change driver referred to as the *opportunity* to change acts on the change dimension *surprise of change*. This driver and dimension examines the expectation of an information system(s) to change and what effect this expectation has on the information system(s). This dimension of change is characterised by the risk of undertaking the change, the cost of the change, the amount of planning required for the change, the time allocated to undertake the change, the organisation level from where the change originated and finally, will there be a change in IS environment or IS service provider.

(iii) *Intent*

The generalised IS change driver referred to as the *intent* to change acts on the change dimension *motivation for change*. This driver and dimension examines the stimulus for information system(s) to change. This dimension of change is characterised by the source of change and the overall motivation for the change.

The set of characteristics or information system change differentials have been derived from the generalised drivers and dimensions in order to establish an overall IS Change framework. The change differentials are described below and the results stipulated in the framework table.

(i) *Planning of Change*

The planning required for the system change to be implemented is referred to as the planning of change. Shelly et al (1998, 24 - 27) state that most IT projects are originated from a planning process. This is usually based on the organisation's mission statement and resulting strategic plan. Plans are normally set for one, two or three year periods. It is further implied by Shelly et al, through their research, that this type of planning is only for new development projects. Maintenance is more reactive and no formal planning could take place. Following Shelly et al's rationale different levels or types of planning (for example strategic, project, detailed work planning) would be required for different classes of system change.

(ii) *Number of Systems Affected*

The number of information systems that are affected by this change is a further characteristic of IS Change. In the situation of maintenance the author's experience has shown that normally a single system is maintained at one time, as the requirement is to merely amend or update a single feature in the system. Further, a new development is often the replacement of a single outdated system with a more sophisticated system. A BPR project is defined by McLeod et al (1996, 5 -9) as being one which seeks new ways of handling business processes. A business process could cut across a number of systems and not necessarily equate to a single system and therefore BPR could affect a number of systems.

(iii) *Motivation for Change*

The underlying reason for this change, its major antecedent. According to Erlank (1997,39) in response to the question of where a system originates - a project comes into being in response to a business opportunity, a directive from senior management or a

problem with the current business. This seems true mainly for new developments. There is different motivation for a disaster recovery information system change which is brought about by a need to continue the business.

(iv) *Data changes*

This characteristic describes the affect that IS change has on the content of data, that is data being removed or is additional data required as a result of this change. Data changes can be of two types. Firstly a change to the underlying data structure by adding fields and/or entities or secondly by adding to the data volume or increasing the number of records in a database.

This is supported by Erlank (1997, 130 - 133) who implies that each system has its own data set and by maintaining or replacing that system the data itself may not need to be changed. In a disaster recovery situation the data may need to be recovered but not necessarily changed. BPR on the other hand could call for a number of new entities.

(v) *Processing changes*

The characteristic defines the affect the system change has on the underlying business processes. A system change such as BPR is almost synonymous with processing change Hammer (1993, 105) Kettinger et al (1997, 55 - 59).

Maintenance changes or enhancements may not necessarily call for a major change in the underlying business process. A tactical change on the other hand may have no affect on the processing at all as the out sourcing of technical support, which is an example of tactical change, may not necessarily call for any change to the system process.

(vi) *Time to implement change*

The duration of the system change project is a further IS change characteristic stipulated in the diagram above. The time taken to undertake a maintenance enhancement is less than that required to develop a new system. A fully fledged BPR exercise is likely to

take even more time.

(vii) Organisation Level

This characteristic shows what level of the organisation is affected by the IS change in terms of operational, tactical, strategic level. The literature indicates that maintenance changes generally have an effect at an operational or tactical level whereas changes such as BPR are more strategic in nature.

(viii) Source of Change

The source of change characteristic outlines where the change originated in terms of the organisation's hierarchy. (Referring back to the three major areas; strategic management, tactical management, operational management.) The literature suggests that the majority of maintenance type changes would originate at an operational or tactical management level. Other IS change classes such as BPR and Tactical change would generally be originated at a higher level, strategic management. It is generally not always easy to determine the exact source of the change however, in some instances it can be linked to a specific piece of legislation (change of tax law for instance).

(ix) Risk / Cost of change

The cost of implementing such a change and the risk associated with that change is a further defined IS change characteristic. The cost and associated risk of implementing a new development project would be less than that normally associated with a disaster recovery situation. The cost of a project is relatively simple to record and compare for different projects. The risks however, are often difficult to assess and risk comparison is generally a fairly complicated process.

(x) IS Service provider affected

The effect this change has on the IT department or the department providing the computer services. The IS service provider can be changed if the organisations management deem that a tactical IS change is necessary. An example that can be used to

illustrate this particular point is, if the tactical information system change decision was to outsource one or more information systems then an outsourced service provider will be used as opposed to the internal IT department. This change would represent an instance where the IS Service provider is affected.

(xi) *Environment Change*

Any change to the physical environment is characterised as Environment Change. The IS environment can be changed if the organisation's management deem that a tactical IS change is necessary.

This above list of eleven IS change characteristics is not completely exhaustive and argument can be made for additional characteristics to be introduced. The list was generated from an extensive review of the current IS change literature and does, in the author's opinion, represent the major information system change characteristics. Initial attempts were made, by the author, to rank each characteristic in an effort to determine their relevant importance. It was found that no substance can be given to claims that one characteristic is more important or relevant in all situations, therefore no formal importance ranking was undertaken.

A framework can be constructed as described in Table 4 below, by placing each of the defined characteristics against the generic IS change class and recording the result. What the framework depicts is that each class of system change is unique in terms of the set of characteristics used to define them. Certain classes have similar characteristics such as maintenance and new development both have the same characteristic in that they normally affect only one system. However, each of the classes is differentiated by means of other characteristics such as the cost and time taken to implement change.

Characteristics	Maintenance	New Development	Tactical Change	BPR	Disaster Recovery
Planning of Change	Limited if any	Detailed	Strategic Detailed	Strategic Detailed	No
Number of Systems Affected	One	One	Some or all	Some or all	One, some or all
Motivation for Change	Change in requirement	New requirement	Reduce costs and improve efficiency	Improve profit of overall process	Survival
Data changes	Data sometimes or not affected	New Data	Data not affected	Focus on better utilisation of data	Data needs to be recovered
Processing changes	Process amended	New Process	Same Process only managed differently	Complete revision of processes	Same process to be recovered
Time taken to implement change	Short period	Medium term	Long Term	Long Term	Short Period
Organisation level	Operational	Operational, Tactical	Tactical, Strategic	Tactical, Strategic	All levels
Source of Change	Division/User	Departmental/ User	Corporate	Corporate	Environment
Risk / Cost of change	Low	Medium	High	High	High
IS Service provider change	Not	Not	Yes	Maybe	Not
Environment Change	Not affected	Not affected	Could be affected	Not affected	Seriously affected

Table 4 : Information System Change Framework

2.2.5 Summary

Organisations are formal social structures that consist of three main components; structure, culture and systems. Certain events, both in the organisation's environment and internally to the organisation, occur and these can cause or trigger change to one or more of these organisational components. Sample lists giving examples of different types of triggers have been provided in Tables 1 and 2.

The literature review concentrates on the “systems” component of the organisation and more specifically the electronic or computerised systems of an organisation. Organisational changes could have an affect on these electronic information systems. These information systems which are affected by change fall into one or more of the following classes ; Executive Support Systems, Decision Support Systems, Management Information Systems, Knowledge Worker Systems, Office Automation Systems and Transaction Processing Systems.

It was illustrated by means of an example that organisational change can lead to information systems change to one or more of the information system classes. A generic list of the different possible change types, or ways a change can be affected to one or more information systems, was presented. These types include; Maintenance, New Development, Tactical Change, BPR and Disaster Recovery.

Finally a framework was presented defining a set of characteristics of information system change against each of the IS change types identified. The set of these characteristics for each change type was what made the change type unique. This framework will be used in the next section to give a preliminary indication as to whether Restructural Change is a unique IS change type.

2.3 Restructural Change

2.3.1 Definition and Business Case for Restructural Change

The preceding sections have identified a set of information system change classes which were categorised and placed in a framework. The purpose of this section is to introduce a new type of information system change class referred to as “Restructural Change”.

There is little doubt about the usefulness and ubiquitousness of computers and the use of computers in managing information based systems. This submission is made by many authors and categorically stated by Van Steenis (1990) who points out that “We are rapidly changing from an industrial society to an information society, in which information is a prime resource. Computers can save time, increase efficiency, and give information about organisations and their customers.” (Van Steenis 1990, 9)

This accepted, the next possible question is this : What are the motivating factors for the implementation of automated information systems? The literature presented on Information System change focuses on the use of information systems for the improvement of a function or number of functions within the business. This includes making the organisation more efficient and more competitive through the use of technology. Callon (1996) in his book “Competitive Advantage Through Information Technology” cites many examples and case studies of how businesses have improved through the effective use of information systems. A quotation from his book outlines this line of thinking :

“Literally every enterprise, whether private or public, faces unprecedented competitive challenges. The source of the challenges is becoming more global, and the pace of the change within the business environment is accelerating. To respond to these challenges an enterprise needs to develop a necessary and logical vision based on the understanding of the business environment and the strengths and potential of the enterprise. The business vision and its supporting strategies drive the role and use of information systems within the organisation. ” Callon (1996, 17)

From the literature it is clear that the majority of information system change is brought about to improve the organisation in some way, be it by making it more competitive or efficient. The factors which identify the need for improving the organisation are identified by various internal and external triggers which affect the organisation itself, this was discussed in-depth as part of Organisational change Section 2.1.

The set of change types identified are then used at varying levels to effect the information system change caused by the organisational change triggers.

Sadler (1998, 126 - 130) however, introduces a second type of change different to general re-organising caused by internal and external triggers. This change he defines as “organisational transformation” or “radical change”. Sadler (1998, 128) asserts that the purpose of this change is to transform the organisation into “a radically different form of social institution from that which previously existed.” These changes are often more fundamental and far reaching in nature. Sadler goes on to say that the most important aspect of a radical change is the change in organisation culture. What Sadler did not discuss and where there seems to be a dearth of discussion in the modern IT literature is how this so called “radical change” could affect information systems of an organisation.

It is important to clearly state that this research does not argue the importance of culture in radical change but attempts to show that the current information system classes do not cater for such a change.

Often in the industry when improvements are quoted the term “radical” is used to imply a large improvement. Fisher (1996, 46)

Therefore, a change which totally transforms all aspects of the organisation and not just improves (radically or otherwise) business processes is called a “Restructural Change”. To scope this type of change, it can be said that it has more impact than business process re-engineering but less impact than a total disaster.

An example of this type of change is if two organisations, with previously independent structures, cultures and systems, were to form a single organisation by means of a corporate merger. The structural and cultural changes are vast and are often dealt with in management literature but what, from the evidence found during this review, is neglected is what happens to the current set of information systems of each organisation. A further aspect of this type of change is that the timing is extremely sudden and the operational decisions (that affect operational systems) forgo to overriding long term or strategic decisions. An explanation for this statement is provided later in the dissertation.

The current change classes do not cater for such an eventuality or impact to information systems and this change can therefore be added to the Systems Change Framework. This addition is discussed in the next chapter.

2.3.2 Where Restructural Change fits within the IS Change Framework

The introduction of Restructural change as a separate class of information system change needs to be verified by applying it to the system change framework. If most of the characteristics of the “Restructural Change” class are the same as one of the other classes, indications would be that this is not a distinct class.

Restructural change is introduced in Table 5.

Characteristics	Maintenance	New Development	Tactical Change	BPR	Restructural Change	Disaster Recovery
Planning of Change	Limited if any	Detailed	Strategic Detailed	Strategic Detailed	No ✓	No ✓
Number of Systems Affected	One	One	Some or all	Some or all	All ✓	All ✓
Motivation for Change	Change in requirement	New requirement	Reduce costs	Improve profit overall process	Business structure Change	Survival
Data changes	Data not affected	New Data ✓	Data not affected	Focus on better utilisation of data	New Data ✓ and Change Data	Data needs to be recovered
Processing changes	Process amended	New Process ✓	Same Process only managed differently	Complete revision of processes ✓	New / Revised Processes ✓	Same process to be recovered
Time taken to implement change	Short period ✓	Medium term	Long Term	Long Term	Short period ✓	Short Period ✓
Organisation level	Operational	Operational, Tactical	Tactical, Strategic	Tactical, Strategic	All Levels ✓	All levels ✓
Source of Change	Division	Departmental	Corporate ✓	Corporate ✓	Corporate ✓	Corporate ✓
Risk / Cost of change	Low	Medium	High ✓	High ✓	High ✓	High ✓
IS Service provider change	Not	Not	Yes ✓	Maybe	Normally ✓	Not
Environment Change	No	No	Maybe	No	Yes ✓	No
Amalgamated Systems	None	None	None	None	Yes	None

Table 5 : Information System Change Framework - Revised to incorporate Restructural Change

The addition of Restructural Change as outlined in Table 5 above clearly shows that although this type of change has some commonalities with the other classes, mainly BPR and Disaster Recovery, there is enough evidence, provided in the current literature, to suggest that it can form a class in itself.

In order to demonstrate where there is a similarity between Restructural Change and other change classes an indicator “✓” is provided.

By introducing a further characteristic which was not contemplated in the initial framework the Restructural change class is further uniquely defined. This new characteristic is the concept of an “Amalgamated System”. In Restructural Change there is a possibility that two information systems were used initially and as a result of the Restructural change a single business function is formed which no longer requires two systems. An example of this could be in the case of a merger of two organisations each with their own payroll application. Once the merger is complete a single application is required.

The concept of an amalgamated system is unique to Restructural Change. Unlike a parallel run which is sometimes used in new development the amalgamated system is the fusing of two similar systems to form a new system.

As the concept of “Restructural Change” is being proposed by the author, current IS literature has not provided a grounding for this area of system change. Further investigation needs to be undertaken to fully conceptualise the idea and discuss further peripheral issues such as appropriate methods etc.

2.4 CONCLUSION

The intention of the literature review is to outline the current academic thinking in terms of organisational change and how this affects information systems. What was discovered, is that organisations are affected by change triggers, both external, factors outside of the organisation, and internal, factors within the organisation. The changes affect all components of the organisation, namely the structure, culture and systems.

This review focused on how change affected systems and more specifically information systems. It was reported that there are different classes of change that can be applied to information systems.

The IS change classes focused mainly on improving or altering information systems to meet the specific requirement caused as a result of the change. However, Sadler identified a type of change which totally transforms the structure of the organisation. This led to the introduction of the concept of the Restructural Change.

Restructural Change was applied to the IS Change framework and initial indications are that it is a separate IS change class. In order to provide more substantial evidence of the Restructural Change concept, case study research will be employed using organisations that have been through a radical structural transformation, such as mergers or political restructuring.

It is anticipated that not only will this be identified as a different class of system change but methods for implementing this type of change will be identified and discussed during the research.

CHAPTER 3 : METHODOLOGY

3.1 INTRODUCTION

The previous two chapters have set the context for the study as follows:

The research question is : “What are the scope and limitations of the current information system modelling concepts and information system modelling tools as a response to the informational requirements of organisations going through different types or magnitudes of information system change. ” Information System Change, in this context, has been defined as the changes to the information system, events and interfaces that are applied to a particular (or set of) information systems.

Currently, as established in depth during the literature review and presented in the previous chapter, there are a number of types of information system change :

- | | |
|---------------------------------------|-----------------------|
| (i) Maintenance | (iv) Tactical Change |
| (ii) New Development | (v) Disaster Recovery |
| (iii) Business Process Re-engineering | |

The aim of this dissertation is to study the various factors or variables that define the above change category items and to create an exhaustive list of these categories by introducing a further more drastic, externally induced change, such as is currently being experienced by governmental or quasi-governmental organisations in South Africa. These externally induced changes to information systems are more complex in that they are generally politically motivated and not financially motivated and have been referred to as Restructural Changes.

Research investigation has shown (to be ratified during the case study phase of the dissertation) that there are a number of new challenges, as far as is concerned, when

Restructural Change is introduced. These have been modelled and presented as part of the literature review. This model will be tested during the Case Study research component.

The following initial hypotheses are proposed for this research :

- H1 Among the different categories of information system change, a further unique category Restructural Change can be added.
- H2 Typical system development approaches, which are currently used and deemed appropriate for conventional IS change are inadequate for implementing Restructural Changes in an organisation.

3.2 APPROACH

3.2.1 Overview of Approach

This research design makes use of a case study approach to develop and refine generalisable concepts and frames of reference. This will be a revelatory case study, as defined by Bensbasat *et al* (1987), which means that only one example or case implementation will be studied. Despite the fact that this is a single case study it, will be examined in detail to ensure that the findings are accurate and appropriate. The unit of analysis for this case study is the ProMIS Billing Implementation Project. From the results of this study the author intends to make generalisations concerning this type of information system change concept that can be applied to other governmental organisations.

Sakaran (1992) agrees that the strength of the case study approach is that it enables the capture of reality in greater detail as a result of the analysis of a large number of variables. Sekaran continues by stating that the weakness of this approach is that its application is restricted to a single organisation and hence there are some problems associated with generalisation from an individual case study. An attempt has been made to ensure that factors specific to the organisation researched, as part of the case study, which may affect the generalisations made, have been accounted for.

The planning of this study was initiated by discussion held with members of the faculty at UCT and impetus provided by the author's long term involvement in local government. The ideas were conceptualised and placed into a formal proposal. A completed literature review provided the theoretical background for the case study. The author has recently completed working on the project and has been granted full access to all other team members and documentation. The author has obtained permission from the City of Cape Town (CCT) to use this project as the basis of his masters dissertation. This commitment by the CCT and the necessary access to all the project information and staff allowed for the gathering of project data.

Once the necessary data were collated, formal and informal discussions were held with the CCT staff and management as well as the consultant team members in order to qualify and verify the researched information.

Final information contained in this case study was quality assured by members of the project team. This quality assurance took the form of individual project team members reading through the final dissertation and providing comment and criticism where necessary.

3.3.2 Author's Role in Case Study

The author was involved in the case study by assisting, as an information systems consultant, in the conversion process from the systems in the amalgamated areas to those of the City of Cape Town. The overall project was not managed by the author. However, certain conversion functionality was undertaken by the author.

Effort was made to distinguish the role of the author from those of participant and observer.

3.2.3 Limitations of the Case Study

A single, project-based study is bound to raise issues that are specific to this particular project. This could imply that generalisations made using the New Billing Project as an example could be false in that they are issues specific to this project and may not be applicable to other Restructural Change Projects.

A further limitation is the fact that this project was undertaken for a local government organisation and as such may have constraining factors which are not applicable to commercial organisations. This could imply that concepts demonstrated in respect of Restructural Change can only be applied to municipal projects.

As mentioned earlier every effort has been made to account for environment or project specific issues and a generalised observation approach has been used.

3.2.4 Motivation for selecting this project as a Case Study

The reason that the New Billing Project was selected as a case study was the fact that it seemed to have the necessary criteria for testing the Restructural IS Change concept as defined during the literature review. The suitability was demonstrated by the fact that this project called for the amalgamation of disparate and previously autonomous local authority billing systems into a single consolidated system.

The case study was also considered interesting from a South African perspective because the amalgamation included two very politically and socially disparate areas. Firstly, the local authority, Pinelands, was considered an affluent, previously “white” (as defined by the now defunct group areas act) suburb. The second area, IKAPA, was referred to as a “black” local authority which managed both formal and informal housing and services.

These two areas had to be amalgamated into the new City of Cape Town and the same level of service and general business rules had to apply to both areas as they were now considered as part of a single municipal structure.

This Restructural Change project therefore called for the amalgamation of completely autonomous organisations and systems which had absolutely no previous contact or interaction prior to this amalgamation process. Despite the fact that these organisations were offering a similar service to their respective communities, their information systems were different in a number of respects, this provided a practical Restructural Change case as theoretically described in the literature review.

3.3 DATA COLLECTION METHODS

Several data collection methods were employed in this research project.

These were :

(i) **Documentation**

All written material concerning this project ranging from memoranda to formal reports were studied. These include all major documents such as the Project Identification document which called for funds to be released in order to undertake the project. Examples of such documentation range from the Project Plans, which set the terms of reference for the project, to the Project Closure Report which officially closed the project and placed it into a maintenance environment.

All documentation pertaining to this project produced by staff of the CCT and relevant consultants was examined in detail.

(ii) **Archival Reports**

CCT organisation charts and strategy documents were studied and, with permission of CCT management, selected aspects of these documents were reproduced. These documents provided background to the underlying business philosophy of the CCT as well as South African local government as a whole.

(iii) **Interviews**

A number of informal open-ended interviews were conducted in this study. Although the interviews were held extensively throughout the life of the project, they were used primarily to fill the gaps left by the other collection methods and to allow the users and team members the opportunity to express views privately and ideas possibly not shared by the remaining team members and user community.

At the end of the project, from August 1999 through to October 1999, a series of ten comprehensive formal interviews (See Appendix A containing the interview questions) were completed with carefully selected participants in the project. The participants included; the Project Owner, Project Manager, Senior Users, Stage Managers and User Business Analysts.

All formal interviews with users, project sponsors and team members have been documented and are available for verification.

(iv) Direct Observation

Throughout the project the author, who was given official permission to observe the project, absorbed and noted details, actions and subtleties of the field environment. This was done by attending project team meetings and being present when certain aspects of the work was undertaken, such as the actual data conversions, going live with new accounts etc.

This study covered a period of approximately 18 months, starting with the preliminary planning work for the project undertaken during February 1998 and ending with the Project Closure document published in August 1999. The actual data collection for this dissertation commenced directly after the project was completed and ended in October 1999.

3.4 APPROACH USED TO VERIFY FRAMEWORK

The core of this particular research is the Information Systems Change Framework as presented in Chapter Two of this paper. This section chronicles the approach used to verify the various characteristics which uniquely identify the classes of IS change and define the concept of Restructural Change as a unique class in its own right. This section serves as the practical support for the theoretical ideas presented in Chapter Two, Section 2.3.2 of this dissertation, where the different classes of IS change and their characteristics are summarised in Table 5.

(i) **Planning of Change**

The planning characteristic was tested by studying the planning process and resulting plans of what was deemed as a practical example of a Restructural Change, the New Billing Project. Further, to compare the New Billing Project plans to that of other CCT projects recently completed. These other plans showed characteristics of the remaining classes of IS change. Features of the plans that were examined were the source of the plans (ie. where the plans originated), the scope and detail of the planning as well as the actual planning techniques used.

Formal questions relating to the planning of this project were put to the various interviewees. The full set of questions asked are documented as Appendix A of this paper. The questions associated directly to this concept that were used as a basis for associated conclusions are 5.1.6 and 5.2.1.

(ii) **Number of Systems Affected**

It was stated during the literature review that Restructural Change differed to other classes of IS change in that this type of change often affected more than one information system. In order to determine the number of systems affected during this case study a list of the various systems affected was made. This list of systems was compared to other recently completed projects in order to determine whether this concept is in fact a

differentiating factor.

Questions were posed during the formal interview process (5.2.3 and 5.2.4) at which it was established what systems were affected by Restructural Change.

(iii) **Motivation for Change**

The motivation for change can be defined as the major reason for embarking on the particular IS change and was a characteristic that was identified during the literature review. It was the contention of the review that the motivation for Restructural Change is not primarily business improvement or profit motivated. The motivation for Restructural Change could be only incidentally related to business improvement, such as a desire to assimilate systems as a result of a merger or similar large reorganisation.

The motivation for change was established for the New Billing Project by studying various items of project documents such as the Project Brief, Project Initiation Document and Project Identification Document. Further, an examination of the actual legislation which called for the countrywide municipal restructuring was also completed.

Further, questions relating to the primary motivation of this project were put to the various interviewees. The questions associated directly with this concept that were used as a basis for associated conclusions were 5.1.1, 5.2.2, 5.2.5, 5.2.14.

(iv) **Data changes**

During the literature review it was noted that with Restructural Change, there should be a strong possibility of additional data being added or removed as a result of the change. Unlike some other types of change where the data content essentially remains the same, Restructural Change normally calls for large amounts of additional information to be added to the data set.

The extent of data change was established for the New Billing Project by investigating and recording statistics on the data structure and set of information contained within the various databases before and after the project.

To further clarify, changes to the database were studied from two main perspectives. Firstly changes to the data structure, that is, were additional fields required to be added to the database dictionary. Secondly, did the content or number of records increase as a result of the Restructural Change, that is, were there more records added to the database as a result of the change.

To support this concept, questions relating to the data content of the various databases affected by this project were put to the various interviewees, more specifically the database administrators.

The questions associated directly with this concept that were used to support associated conclusions were 5.2.7 and 5.2.8.

(v) **Processing changes**

The literature review attempted to establish that with Restructural Change there is not a complete revision of processes, instead the existing processes are revised with additional processes being added.

The processing required for the New Billing Project was analysed by studying the overall functionality of the various application systems before and after the project. This analysis clearly demonstrated the extent of the processing change.

To support this concept questions relating to the functionality of the systems affected by this project was put to the various interviewees. The questions associated directly with this concept used to support associated conclusions were 5.2.9 and 5.2.10.

(vi) **Time taken to implement change**

One assertion made during the literature review was the fact that Restructural Change has to be implemented far quicker than other IS changes.

The time taken to implement the New Billing Project will be compared to that of other implementations. This should demonstrate whether a Restructural Change should be implemented any faster than other changes. Questions were put to the interviewees in this regard, refer 5.2.11 of Appendix A.

(vii) **Organisation level**

This characteristic attempts to monitor the level in the organisation's hierarchy that was affected by the Restructural Change. It was specified during the literature review that Restructural Change affected the organisation at all levels; operational, tactical and strategic. It was suggested that most other classes of IS change do not necessarily affect all levels of the organisation.

To support this concept, questions relating to the level of the organisations affected as a result of the New Billing Project were put to the various interviewees. A number of questions associated directly to this concept were used to support associated conclusions. The questions include 5.1.1, 5.2.6 and 5.2.12 of the formal interview questionnaire.

(viii) **Source of Change**

The source of change is a characteristic defined by the literature as being where the original IS change was initiated. This could be from strategic management (such as the board of directors), tactical management or operational management. It is suggested in the literature review that Restructural Change is initiated at the highest possible level of an organisation.

To clarify how the New Billing project was initiated, minutes of strategic management meetings have been studied as well as documented legislation calling for the

amalgamation was reviewed.

To further support various related concepts, questions relating to how the project was initiated were put to the various interviewees. The questions associated directly with this concept that were used to support associated conclusions were 5.1.1, 5.2.2, 5.2.5, 5.2.6, and 5.2.14.

(ix) Risk / Cost of change

The general risk and cost characteristics associated with a Restructural Change project were considered during the literature review as being a differentiating factor in terms of IS change classes.

To verify the cost and documented risk associated with the New Billing Project the project budget and planning was studied and comparisons, where possible, were made to other large IT implementations.

To further examine the risk and cost aspect of the project related questions were put to the interviewees. The questions associated directly with this concept that were used to support associated conclusions were 5.2.15, 5.2.16 and 5.2.17.

(x) IS Service provider change

During the literature review it seemed that a Restructural Change was characterised by a change in the provider of IT related services. This was observed during the implementation of the New Billing project and further supported with a question 5.2.18 (Appendix A) during the formal interview process.

(xi) Environment Change

During the literature review it seemed that a Restructural Change was often characterised by a change in the IT environment. This was observed during the implementation of the New Billing project by undertaking an analysis of the various affected environments and

further supported with a question 5.2.19 (Appendix A) during the formal interview process.

(xii) **Amalgamated Systems**

It was argued during the literature review that one of the most important characteristics of Restructural Change was the concept of the need to amalgamate systems. It was theorised that during Restructural Change there is often more than one information system offering the same or similar functionality. Further, during the Restructural Change process one of those systems needed to be chosen as the new master system. The data of the system(s) not chosen then needed to be migrated to the preferred system.

This concept was observed during the implementation of the New Billing Project and the studying of project plans, project issue reports and project team meeting minutes.

To support this concept questions relating to the project were put to the various interviewees. The questions associated directly with this concept that were used to support associated conclusions were 5.2.20 and 5.2.21.

3.5 APPROACH USED TO OBSERVE RESTRUCTURAL CHANGE DEVELOPMENT TECHNIQUES

It has been theoretically authenticated by the literature review that there are different classes of IS change. Restructural Change is one of those classes as defined in the context of the various characteristics specified in the previous section. It needs to be further established whether a different approach to developing or implementing a Restructural Change project would be needed.

The approach to implementing the New Billing Project was studied and compared to that of other IT implementations.

Formal questions relating to the development of this project were put to the various interviewees. The full set of questions regarding the development techniques have been documented in section 5.3 of the questionnaire.

CHAPTER 4 : OUTLINE OF CASE STUDY

4.1 INTRODUCTION

This research project follows the City of Cape Town's (CCT) attempt to manage the change to one its major information systems as a result of the local government restructuring which took place in the Western Cape in the mid nineties. This type of change was identified as unique and defined as "Restructural Change" in the literature review. The purpose of this case study is to describe how this change was identified, analysed and implemented and if lessons were learnt that could be used in the event of further Restructural Change taking place in the future.

The description of this case study is broken down into three major sections. The following section chronicles the background and motivation for the local government or municipal restructuring in the Western Cape. The next section details the current information systems infrastructure at the CCT, highlighting the diversity of the operational systems within the CCT both prior to and after the restructuring exercise. The final section details a single specific project that was brought about as a direct result of the local government restructuring exercise itself.

4.2 MOTIVATION FOR CHANGE IN THE WESTERN CAPE

In his article entitled "The Democratisation of South African Local Government" Cameron (1996) pointed out that the start of local government change was in March 1993 where a body referred to as the Local Government Negotiating Forum (LGNF) "acted as a midwife for local government reform".

Cameron further outlined the mission of the LGNF was "To contribute to the democratisation of local government and the bringing about of a democratic, non-racial, non-sexist and financially viable local government system".

Prior to the establishment of this forum local government structures in the Western Cape were highly fragmented and ethnically-demarcated. There were approximately 69 local authorities with a divergent and disparate range and level of services, powers, ethnic bases, fiscal resources, financial viability and autonomy. These statements are derived from a "Position Paper" published and presented by the Cape Town City Council in August 1993.

This move toward change was provincially gazetted in the Provincial Gazette 4943, Friday 7 April 1995. For reference purposes the following has been reproduced from the gazette.

- 2.1 The parties believe that, in accordance with the provisions of the Local Government Transition Act, No. 209 of 1993 ("the Act") and the Reconstruction and Development Programme, local government should move to democracy and social stability as rapidly as possible, should amalgamate jurisdictions effectively, should prepare and adopt single budgets for single municipal areas, and should maintain, restore and upgrade services.

What is important to note in this gazette is that the transition or amalgamation had to be rapid. Further, when studying the various local government restructuring publications and literature very little if any mention was made of the information systems used by the various amalgamated municipalities. However, no true amalgamation of any organisation can take place without the effective integration of their respective information systems. This is clearly demonstrated below.

The restructuring process was initiated in late 1995 and was completed from an organisational structure point of view in 1997. This organisational transition is evident from a letter drafted by the then recently appointed City of Cape Town City Manager, Andrew Boraine. In his letter, he stated that 1997 was a year of ongoing restructuring and the priorities by the end of that year were as follows :

- * to integrate the former administrations into the new City of Cape Town;
- * to allocate all functions to appropriate parts of the organisation;
- * to strengthen reporting lines and management structures and

- * to confirm the placement of all staff in the new organisation on the basis of “staff follow function”.

It should be noted that at the top of the City Manager’s list of priorities was the integration of the former administrations. Each of these previously autonomous administrations had major information systems driving their respective business processes. A good example of this was that each administration had their own billing information systems. The amalgamation of these billing systems later forms the focal point of the case study on Restructural Change.

A number of technology projects were then initiated, in late 1997 and early 1998, to accommodate this Western Cape local government restructuring process. Each of these initiatives such as the consolidation of the payroll and stores systems was testimony to the concept of Restructural Change as defined by the literature review. One example of such a project, and the one which provides the base information for the case study chosen was the “New Billing Implementation” project which will be discussed in detail below.

The New Billing Implementation Project called for the amalgamation of the various billing information systems of each of the previously autonomous municipal administrations. When this situation was measured against the literature describing the characteristics of a Restructural Change, the New Billing Project appeared to be a truly demonstrative and practical example of the previously defined concept of Restructural Information System Change.

4.3 THE CITY OF CAPE TOWN'S COMPUTER STRATEGY AND INFRASTRUCTURE

The Directorate of Information Technology Services(DITS) of the CCT, much like most branches and departments in local government, has been going through and will continue to go through a number of fundamental changes in terms of its management structure and emphasis. In an attempt to define and co-ordinate these changes, a discussion document was drafted by senior officials of the then Town Clerk's department, in an attempt to chronicle the revised business emphasis or strategy of the CCT. A high level business strategy was then stipulated in a document referred to as the "Vision 2000". The CCT's computer strategy is built around this general CCT business strategy.

From the Vision 2000 document the following mission statement of the CCT was extracted:

The Cape Town City Council is committed to :

- ✓ *Attaining a democratic local government*
- ✓ *Redressing past inequities*
- ✓ *Supplying effective and efficient services; and*
- ✓ *Making Cape Town a better place for all its people.*

(Greenwood, 1994)

In November of 1990 a Corporate Information Systems Strategy was developed by PE Corporate Services and this study defined a new technological path for the CCT, which, up until then, was mainly mainframe based computing.

With the proliferation of PCS and networks in the late eighties and early nineties it was recommended and agreed as part of the IS strategic study that the CCT should develop a corporate network connecting all equipment. Furthermore the CCT should adopt Open Systems Interconnection (OSI) standards in relation to its computer equipment.

The strategy proposed by PE Corporate Services essentially recommended the move from a centralised mainframe environment to a decentralised environment. This had a number of advantages, such as the overall reduction in IS costs.

In summary, the DITS had two main strategic priorities : firstly, to assist in the facilitation of the local government restructuring process; and, secondly, to migrate from what was essentially a mainframe environment to what was perceived as a less costly and modern midrange environment. These two strategic requirements were what prompted the CCT to commission a single project, to incorporate other municipalities' billing processes and to migrate the main CCT billing process from the mainframe to a single consolidated billing application package. This project became known as the "Final Consolidation and Integration of the City of Cape Town Billing Processes" or referred to as "The New Billing Project".

This project was tested against the IS change framework where the DITS had the opportunity to maintain the existing systems or develop an entirely new billing application. Neither of these options were deemed acceptable by CCT strategic management and the decision to effect a Restructural IS Change was made.

It should be noted that all IS change has a cost implications associated with it. The economic considerations taken into account as a result of this project were related to IS change but not attributed directly to the Restructural Change concept introduced.

Full details of the Restructural Change New Billing Project will be provided in the following section.

4.4 BACKGROUND AND MOTIVATION FOR THE NEW BILLING PROJECT

4.4.1 Project Initiation

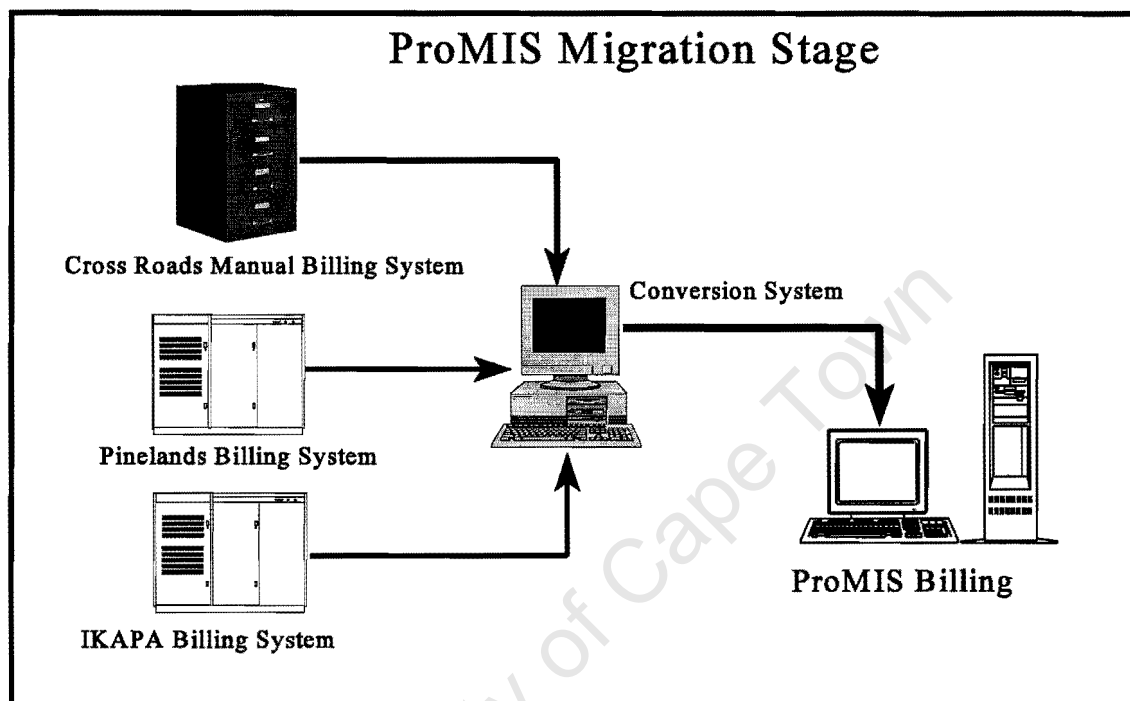


Figure 5 : Graphical Description of Migration from Amalgamated Areas to ProMIS

As depicted in Figure 5 above, one of the most important aspects of the New Billing Project was the amalgamation of four distinct municipal billing systems. This further represents a classic practical example of Restructural Change application.

The four billing information systems, three of which were computerised, had to be consolidated into a single preferred billing system. It should be noted that each of the four systems offered similar functionality in terms of rendering accounts for a municipal area on a periodic basis.

It was the responsibility of the team members of the New Billing project to ensure that the restructuring of the municipal account rendering systems took place and at the same time the consumers of all areas continued to receive a municipal account.

To achieve this a Project Initiation Document (PID) was compiled by the project team and submitted to senior CCT officials for approval. The purpose of this document was to justify the project, define the scope and objectives as well as describe the major deliverables for the project.

In the PID it was made clear that “The City of Cape Town is under obligation to consolidate and integrate its billing processes as a matter of extreme urgency.” It was further stated that the project had to be completed within 18 months. Failing to achieve this would result in a major crisis in respect of the current mainframe computer systems which were not Year 2000 compliant. Equally important was the fact that the complexities and overheads involved with running 6 disparate billing systems at the head office and remote offices such as Pinelands, IKAPA etc. could not be sustained for much longer.

To summarise, this project was initiated to allow the restructured CCT to incorporate the various smaller municipalities into its billing procedure and at the same time migrate billing information and functionality residing on a mainframe to a modern client server application call ProMIS.

4.4.2 Project Scope and Objectives

The scope of the project was defined in the PID by as follows : “This project includes the full automation of the business processes required for the consolidated billing of ratepayers and other customers for various services rendered by the City of Cape Town.”

Conradie (1998, 3-4)

It was further agreed that the automation of the specified billing processes would be achieved through the use of the ProMIS application package. This was a municipal information system written for South African local authorities and selected by a previous tender process in 1992. The technology used for this package was a Progress Database and front end residing on a UNIX operating system.

The scope and objectives of the project were based on various discussions with senior CCT officials. The results of these discussions and preliminary meetings were defined in the PID and agreed during a formal presentation to the project board. The scope and objectives are as follows :

- the integration of the Pinelands, Langa, Nyanga, Guguletu, Crossroads and Cape Metropolitan Council billing and other income associated processes
- the termination and transfer of property and consumer data to other municipalities such as the South Peninsula Municipality
- the upgrading of all billing related systems to ensure Year 2000 compliance
- the migration of all billing related systems to less expensive platforms as envisaged by the Information Technology Strategic Plan which was adopted by Council a few years ago
- the decommissioning of billing systems which run on the ICL mainframe
- the extension of the scope of the ProMIS implementation to include all Miscellaneous, Housing Letting and Housing Selling accounts as well.

The first objective called for the amalgamation of the various previously autonomous municipal billing applications, is what prompted the need for a Restructural Change exercise and forms the basis of the case study.

4.4.3 **Project Organisation**

In accordance with the CCT standard project management method (PRINCE) framework for project management, an organisation structure was established to execute, monitor and approve all activities of the project. The names of the personnel involved will not be provided. However, the assigned project roles are given below.

ROLE	ROLE DESCRIPTION
Steering Committee Members :	
Executive	Top strategic manager equivalent of the Chief Executive Officer
Senior Users	Strategic management in the Finance Department
Senior Technical	Manager of the IT department
Client (Owner)	Tactical Manager responsible for the Billing process
Project Team :	
Project Manager - Business	Consultant with expertise in Billing and Local Government Finance
Project Manager - Technical	Consultant with Billing System and technical infrastructure expertise
Stage Managers	Responsible for the delivery of each stage.
User Business Analysts	Provide expertise on the detailed billing process
Project Secretary	Project administration
Technical Support Team	Network and general operating system support

4.4.4 Project Deliverables

The overall New Billing Project was split into eight separate stages as graphically represented in Figure 6 below. Each stage represented a collection or a logical set of activities that needed to be completed in order to meet one of the overall project objectives. Each stage and its overall purpose and how it demonstrates Restructural change is described below.

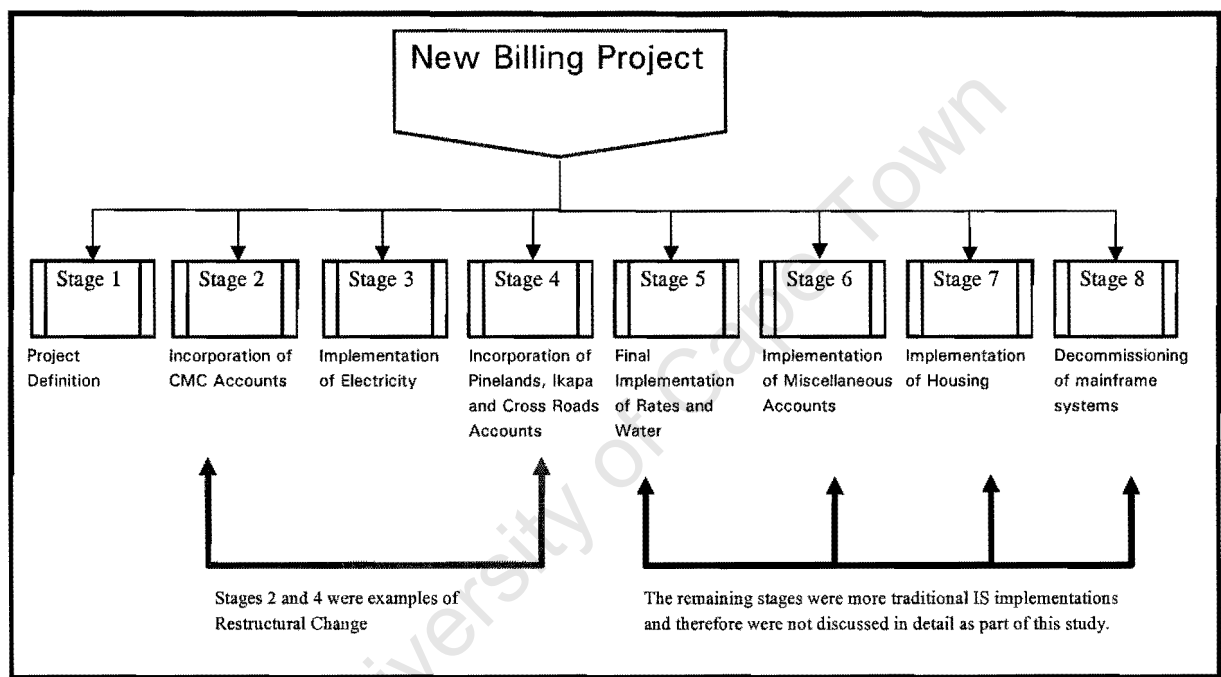


Figure 6 : Stages of the New Billing Project

Stage 1: Project Definition

This stage was the first stage of the project and was used to allow for the finalisation of the various business requirements for the entire project as well as to allow for the more detailed planning of the remaining Stages. This stage initiated certain aspects of Restructural Change, however the exact nature of the change is specified in the remaining Stages.

Stage 2 : Incorporation of CMC accounts

This stage, which was undertaken in parallel to stages 3 and 4, centred around the extraction of billing information of consumers who were originally billed by the Cape Metropolitan Council (CMC) and were, as a result of the restructuring, to be billed by the CCT. This, when considered against the literature review, was a reasonable example of Restructural Change as this information had to be migrated from the CMC infrastructure to that of the CCT.

Stage 3 : Implementation of Electricity

This stage, which was undertaken in parallel to stages 2 and 4, involved the extraction of Electricity billing and installation information from the CCT's ICL mainframe and migration to the ProMIS application. This did not fully demonstrate Restructural Change as it was deemed a straight conversion from the existing ICL system to the new ProMIS system.

Stage 4 : Incorporation of Pinelands, IKAPA and Crossroads accounts

This Stage will be examined in depth and used to describe a practical example of Restructural Change. It will be described in the context of the overall project and will be compared to other stages in order to clearly demonstrate how Restructural change differs from other IS change forms.

This stage, which was undertaken in parallel to stages 2 and 3, involved the study of each of these previously autonomous local authorities. The account billing function of each of these authorities had to be investigated from business and technical points of view and amalgamated with the business and infrastructure of the CCT. This is an excellent example of Restructural Change as defined in the literature review. To validate the previous statement, it will be clearly demonstrated how this part of the project fits into the IS Change model presented by the review.

Stage 5 : Final Implementation of Rates and Water

This stage called for the finalisation of a previous project to implement rates and water account functionality. This stage represented a maintenance type IS change and was not considered a good example of Restructural Change functionality.

Stage 6 : Implementation of Miscellaneous Accounts

The objective of this stage was the transfer of a number of miscellaneous accounts from the ICL VME machine to the new ProMIS application. Although this stage had some Restructural characteristics it was not considered as good an example of such an IS change as Stage 4.

Stage 7 : Implementation of Housing

This stage called for the implementation of a new housing module on the ProMIS application. This implementation was considered a New Development or Major Maintenance assignment, as a result it was not studied as part of a Restructural Change exercise.

Stage 8 : Decommissioning of ICL mainframe systems

The final stage of this project was the decommissioning of the mainframe machine. This was considered a technical function outside the scope of the Restructural Change concept.

4.4.5 Stage 4 : Incorporation of Pinelands, IKAPA and Crossroads accounts

4.4.5.1 Introduction and Objectives of the Stage

The best examples of Restructural Change were identified in Stage 4 of this project. The scope of this stage was the incorporation of previously autonomous local authorities. These were identified as Pinelands, IKAPA and Crossroads. These incorporated local authorities had billing systems which needed to be included in the complete billing functionality of the CCT including the data, business rules and staff.

The objectives of the stage accepted by CCT management were as follows :

- investigate the current business rules and tariffs being applied to each of the specified outlying areas
- investigate the application systems of these outlying areas and establish the nature and quality of their information
- with the assistance of Corporate Finance management resolve any differences between the old business rules and those currently being applied at the CCT
- determine whether access to the billing system is required at each of these areas and if so, to ensure that there is a suitable technical infrastructure to run the ProMIS application
- re-skill the amalgamated staff in the use of the ProMIS application system and further, to ensure that they have a good understanding of the billing business practices currently employed by the CCT
- successfully import the billing information, such as property information, debtor information and balances from the current heterogeneous computer systems to ProMIS and provide a plan for any further maintenance of that information
- produce consolidated accounts for consumers in these outlying regions

4.4.5.2 Approach used by the Stage Team

It was soon apparent that this stage would not follow the traditional IS Systems Development Life Cycle (SDLC) as defined by contemporary authors such as Silver *et al.* The main reason for this was that the object of this stage was not to develop a new information system from a set of requirements, but rather to convert the information and processes from one established billing system to another billing system. This was not a simple data conversion exercise either, as the business rules managing the data and processes in the respective billing systems were historically different.

The information and processes of each of these billing systems were analysed, amended and converted so as to conform to the CCT's business method of billing consumers. A separate application was developed to facilitate this transformation.

The Crossroads system was a manual or card based system whilst the other two local authority billing systems were computerised. A graphical representation of this required conversion is provided as figure 5 at the beginning of this Chapter. This diagram shows how each of the billing systems were converted from their respective systems to the CCT's ProMIS Billing System.

After detailed analysis of the systems affected by the amalgamation a separate conversion system was developed by the project team. The purpose of this system was to facilitate the transformation of data and processes from the existing billing systems to the new ProMIS Billing System. This system effectively managed the change from one information system to another.

The project team's approach was to undertake each conversion by completing the following high level activities :

- (i) Specify the destination (CCT Billing) technical architecture
- (ii) Specify the destination (CCT Billing) business processes, information and rules
- (iii) Analyse the source technical architecture
- (iv) Analyse the source business processes, information and rules
- (v) Verify the compatibility of the architectures
- (vi) Verify the compatibility of the business processes and rules
- (vii) Re-engineer source business processes
- (viii) Customise the source technical infrastructure to accommodate the technical requirements of the destination system
- (ix) Convert System
- (x) Re-skill and redeploy staff
- (xi) De-commission old system
- (xii) Stage Closure

These high level activities provided a basis against which each of the amalgamated municipality billing information systems would be restructured.

4.4.5.3 Stage Results and Outcomes

The results of the stage will be discussed under the major activity headings. The discussion will also focus, briefly, on how these results relate to the concept of a Restructural Change.

(i) Specify the destination (CCT Billing) technical architecture

The "destination" technical architecture is defined as the configuration on which the eventual restructured system will reside. What is unconventional, caused by the Restructural Change, is that this environment was specified up front and was not

negotiable. In most IT projects there is some flexibility as to what hardware or software the system will eventually use once developed. This concept will be discussed in detail as part of the findings.

A summarised description of the destination environment is as follows :

Name of system	ProMIS Income Vers. 5.4a
Operating environment	Multi-user UNIX based system Sun Solaris 2.6
Programming Language/s	Progress Vers. 8.3b07

(ii) Specify the destination (CCT Billing) business processes, information and rules

The destination business processes and rules were predefined and there was little or no scope for general re-engineering or process improvement. It was clearly stipulated by the project executive that the Restructural Change process called for the amalgamated areas (Pinelands and IKAPA) business processes to be changed, if necessary, to conform to the predominant CCT Billing standard.

The billing process, in essence, deals with the business of generating revenue within the CCT by billing for rates, water, electricity and various miscellaneous charges. These are billed, depending on the service, on a monthly, quarterly, or annual basis. Further, a record of income, property and other debtor information must be kept for all ratepayers and service recipients of the CCT. The rates are calculated based on property values provided by the 1979 general valuation.

The service charges (such as water and refuse removal) are based on national tariffs which are amended annually.

(iii) Analyse the source technical architecture

The source destinations were defined as the technical architectures, hardware and software, from which the relevant billing information needed to be extracted.

These systems had been in production for some time and were providing similar or the same functionality as the ProMIS (destination architecture) application system.

Restructural Change caused some unusual problems in that most IT solutions are implemented to improve a situation or to adapt to a new business situation. In this case, the two systems running at Pinelands and IKAPA respectively were simply discarded. This, from the author's observation, detracted from the general motivation of the users and was especially negative from a supplier (of those systems) perspective.

The following system was used at Pinelands :

Name of system	Parow Bureau Billing System
Operating environment	Multi-user UNIX based system
Programming Language/s	COBOL
Access	DOS Workstation

The following system was used at IKAPA :

Name of system	SAMRAS Billing System
Operating environment	Multi-user UNIX based system
Programming Language/s	COBOL
Access	UNIX Terminal

(iv) Analyse the source business processes, information and rules

Theoretically the source business rules should be exactly the same as destination rules as municipal billing functionality and tariffs are prescribed by a national body. However, there were some functionality differences in the business processes mainly as a result of a number of historical or legacy processes.

Once the business processes of each system were analysed the differences to the CCT system were recorded. The differences are discussed in (vi) Verify the compatibility of the business processes and rules.

(v) Verify the compatibility of the architectures

Despite the fact that both source architectures and the destination architectures are all UNIX based packaged systems there was no further compatibility in the architectures. Separate detailed programs had to be written to extract the information required for the conversion suite of programs. The conversion programs can be regarded as an intermediary step that was needed to load information into the destination system.

(vi) Verify the compatibility of the business processes, information and rules

As discussed earlier the initial prevailing thought on the business processes, information and rules was that all municipal billing systems use essentially the same rules. This was the case for most of the functionality, however there were some subtle but important differences in functionality.

These will be discussed below for clarification purposes.

Differences between Pinelands and CCT Billing :

There were three main differences as far as the rating procedure was concerned. Firstly the last Pinelands property General Valuation (GV) was undertaken in 1981, where as the latest GV for the CCT was undertaken in 1979.

Secondly, the rating approach of Pinelands was to only charge for Community Services ie. an amount of 3.881c/R (c/R = cents charged for each rand of the valuation amount for the property and improvements). Service charges were billed separately. CCT on the other hand had two main components to their rate calculation. The first being a Community Service charge of 10.387 c/R and a Direct Service charge of 2.935 c/R. Further CCT provided a 26% rebate on residential properties.

Finally there was a difference in the processing of Interim Valuations. In Pinelands a single interim property valuation was performed whereby properties with increased value were rated for those improvements for the full year at the current rate. Cape Town ran two interim valuations one in the first six months of the financial year and one in the last six months of the financial year. CCT charges the interim value from the date of completion of the property improvement.

Differences between IKAPA and CCT Billing :

The major difference between these two billing approaches was the fact that the IKAPA properties were not valued due to historic ownership issues. This resulted in a flat fee based approach for rates and services as opposed to a property value based approach.

Once the differences had been established they were documented. Recommendations on their resolution were then put forward, by the project team, to user management.

(vii) Re-engineer source business processes

A number of differences were identified and Project Issue Reports, recommending various solutions were completed. Where possible the source business process was re-engineered to conform to the CCT standard. In terms of Restructural Change it should be noted that the overall motivation for this re-engineering was not to improve the process but to ensure that it conformed to the standards set by the destination system.

(viii) Customise the source technical infrastructure to accommodate the technical requirements of the destination system

As mentioned earlier the source technical infrastructure and the destination technical architecture were totally disparate and separate extraction and conversion programs were necessary to migrate both the source system set of information.

(ix) Convert Systems

The system as a whole did not have to be converted. The conversion revolved around the debtor and billing information in the source systems and how these would be placed in a format that they could be electronically updated into the CCT ProMIS Billing System.

The conversion of the data was undertaken by a specific system which read the extracted data files and converted them to a format which could load the information into the destination system.

Totals of the source and destination fields were balanced to ensure that the conversion did not lose any debtor or property information.

(x) Re-skill and redeploy staff

The staff at the two amalgamated municipalities situated at Pinelands and IKAPA were given extensive training and were redeployed to the Civic Centre in Cape Town to join the CCT billing office.

(xi) De-commission old system

No historic information was taken onto the CCT billing system, therefore the IKAPA and Pinelands systems were closed and retained for historic information purposes.

(xii) Stage Closure

The stage was closed once all the debtor and billing information had been successfully transferred from the amalgamated areas to the CCT billing system.

4.5 CONCLUSION

The CCT's New Billing Project was completed in July 1999 on schedule and within budget. The Restructural component of the project Stage 2, 3 and 4 were completed by December 1998. The success of the project is evident from an extract of the board approved project closure document approved at a meeting held in August 1999.

"The project should be regarded as an unqualified success in that all the original objectives have been attained within time and budget. These are discussed below :

- the integration of the Pinelands, IKAPA, Crossroads and Cape Metropolitan Council billing and other income associated processes has been achieved. Where relevant, the billing staff of these areas have been trained and have been successfully integrated into the staffing complement of the Income and Cash Directorate of Corporate Finance; (Conradie, 1999)

A number of both political and business objectives were achieved as a result of this project, however, it was apparent that this was not a typical Information Technology project. This project, especially Stages 2 and 4, had a number of unusual challenges. These differences, attributed mainly to the local government restructuring process, led to the introduction of an IS change. This IS change, referred to in this research as "Restructural Change", is further analysed, by interpreting project experiences, project documentation and a number of interviews held with project team members, in the next chapter.

CHAPTER 5 : FINDINGS

5.1 INTRODUCTION

After the successful completion of the New Billing Project a series of interviews was performed with key role players of the project in an effort to further analyse the various concepts that characterise Restructural Change. These interviews were held with a wide variety of people involved in the project soon after the project was officially completed and moved into a maintenance environment.

In order to support various definitions presented in the literature review the interviews were focused on the Information System Change Framework that was established earlier in this dissertation and graphically represented in Tables 4 and 5.

This chapter will conclude with the presentation of a revised framework which incorporates the various changes that were established during the case study component of this research.

5.2 ANALYSIS OF FINDINGS

5.2.1 Confirm the IS Change Framework

A set of characteristics of information change were substantiated during the Literature Review Component of this research. An IT project, the New Billing Project, was initiated at the City of Cape Town and a major component of this project was a Restructural Change activity. Various aspects of the Restructural Change Stage of the New Billing project were documented and interviews were held with a varied set of people involved in the Restructural aspect of the project.

A summary of the results are provided in table 6 below followed by the detailed findings.

Dimension	Restructural Change (Literature Review)	Findings
Planning of Change	No changed to <i>Non Strategic, Detailed</i>	Planning was dependent on key decisions being made with regard to the business restructuring. Planning was detailed and more focused on resource allocation.
Number of Systems Affected	All	All systems of the affected organisations were changed as a result of the restructuring.
Motivation for Change	Business structure Change	The change was clearly not motivated by the need for business improvement. The motivation for this change was due to fact that the structure of the business changed.
Data changes	New Data / Change Data	The data structures of the various systems affected were different. This meant that the selected system had to change in structure (changes to the database structure) and volume(number of records were added).
Processing changes	New / Same Revised Processes	Amalgamating the functionality of the similar billing systems as a result of Restructural Change required slight functional amendments be made to both the source systems and the selected system.
Time taken to implement change	Short period	Once the final decisions as to the exact nature of the Restructural Change were made, the time taken to implement the change was limited. This was to encourage morale of the amalgamated staff and counter any negative perceptions of the recently restructured organisation.
Organisation level	All Levels	Restructural Change affected all levels of the organisation including strategic, tactical and operational levels.
Source of Change	Corporate	Restructural Change is initiated at the highest possible level of an organisation.
Risk of Change	High	The risk to the organisation for not completing Restructural Change project was deemed high as there would have been perceptions by consumers that restructuring was not in the best interest of the communities affected.
IS Service provider change	Normally	The various systems affected by a Restructural Change had a change in service provider for one or more of the amalgamated systems. They were now supported by the CCT's IT department.
Environment Change	Affected	The various systems affected by a Restructural Change also had a change in environment for one or more of the amalgamated systems. The environment was defined by the CCT IT department.
Amalgamated Systems	Yes	In this Restructural Change project there was more than one candidate system that could have been chosen as the final system on completion of the amalgamation. The set of candidate systems was referred to as Amalgamated Systems. The decision as to which system was the selected system was made by strategic management based on the high volume of data already residing in that (ProMIS) system.

Table 6 : Summarised findings - Information System Change Framework

The IS Change Framework characteristics are redescribed in italics and the findings are discussed below :

- (i) *Planned Change* : *The planning required for the system change to be implemented.*

The planning characteristic was theoretically presented as not being possible in a Restructural Change environment. It was clear from the case study that the Restructural IS Change was not derived from a long term business oriented strategic plan. However, the impression expressed during the literature review was that no planning could take place and that Restructural Change was more or less reactive.

It followed that once certain broad decisions (approved business directions) were made with respect to the overall Restructural Change, detailed planning could then follow. The project manager and stage managers of the project clearly stated that planning could only take place once key decisions were made and business direction was obtained from the Project Sponsors. This planning was focused more on correct resource allocation as opposed to providing an accurate means to report progress on the project.

It was clear that the differences in the planning attributed to Restructural Change, is different from the planning normally associated with the other classes of IS change. A major reason for this is the fact that the Restructural Change environment is more volatile and its processes less well defined. This made planning more difficult.

This difficulty in planning was clearly demonstrated by that fact that an overall project plan could not be provided at the beginning of the project. Extensive analysis coupled with major business decisions had to be made during the project definition stage. After the Project Definition stage detailed plans were then compiled for each stage. This supported the literature review assertion that overall or strategic planning is not possible in a Restructural Change environment.

As a result of the case study a slight amendment to the Information System Change Framework will be documented. The change is from *No* planning to *Not in Strategic Plan, Commanded* planning. The implication of this statement is that although the importance of Restructural Change is strategic it was not necessarily planned as a strategic component of the long term IT requirement.

Note that the final version of this framework, which will reflect all changes made as a result of the findings, will be provided in Table 9 of this Chapter.

(ii) *Number of Systems affected* : *The number of information systems that were affected by this change.*

Much like the change concepts of BPR and Disaster Recovery, the Restructural Change affected a number of different systems. Unlike those two concepts, the timing of the change class was not as well controlled and managed. These are attributes which are normally associated with BPR. Further, during BPR processes are normally completely remodelled to provide the best possible business practice. The findings of this case study indicate that the most dominant billing system provided the basis for future business processes and those could be, but not necessarily were, the best business practice. An example of this was the approach to calculating rates. The dominant CCT billing system defined the approach for all rates calculations.

It was also discovered that the changes to the systems were not as unplanned and urgent as what is normally associated with a Disaster Recovery situation. This was demonstrated by the fact that each of the systems affected by the Restructural Change were changed in a carefully managed manner against a predefined priority list.

There were certain constraining factors which forced what systems were a Restructural Change priority. Examples of these in this case study was :

- ▣ financial year ends, all balances could be moved across to the new system at a logical point, start afresh;
- ▣ end of support contracts, certain duplicated systems would no longer need to be maintained, therefore the client would rather force the Restructural Change than to continue to maintain both systems;
- ▣ support staff leaving, as a result of the Restructuring a number of support staff resigned or were reallocated to a different substructure;
- ▣ power user staff leaving, as a result of the Restructuring a number of senior user staff resigned or where reallocated to a different substructure.

The above issues forced or supported the actual prioritisation of the set of systems within the organisation that should undergo Restructural Change. Some systems were restructured as a matter of urgency whilst others were done later. This was clearly demonstrated by the amalgamation of the CCT and Pinelands where the billing systems and data were amalgamated as a matter of extreme urgency whilst the payroll systems waited about a year before they underwent Restructural Change.

It was clearly demonstrated during the research interviews that eventually all information systems are affected during a Restructural Change. This supported the original statements made during the literature review and subsequently placed in the framework.

(iii) *Motivation for Change* : *The underlying reason for this change; its major antecedent.*

A strong assertion established in the literature review is that one of the major differentiating factors for Restructural Change is the motivation for that type of change. Restructural Change is motivated by purely political decisions; business improvement is not the underlying motivation for change unlike other types of IS change.

The motivation for the New Billing project fully supported the assertion made in the literature review. It was established during the interview process (especially interviews held with senior managers) that the overall motivation for amalgamating IKAPA, Cross Roads, Pinelands and the City of Cape Town was to conform to the political requirements of revised municipal boundaries. There was no indication that this Restructural Change would bring about improved business functionality.

What became apparent was that operational managers saw an opportunity to not only effect Restructural Change but in the practical situation to implement business improvements as well. Therefore, despite the fact that the IS change was prompted by restructuring managers saw an opportunity to implement business improvement (BPR type) changes as well.

(iv) *Data changes* : *The affect this change had on the content and structure of data, was data removed or was additional data required*

The New Billing Project Case Study clearly demonstrated that with Restructural Change there can come about extensive data changes. The addition of the Pinelands, IKAPA and Crossroads data to that of the current CCT data was a clear demonstration of that fact in that a number of consumers and accounts were added. This addition required an expansion of the database in the region of 50 000 records.

It was also noted that although the basic data should have been the same (billing data) this was certainly not the case for each of the amalgamated billing systems. What became apparent was that as a result of historic and other system constraints the billing data on the non-selected platforms had to be refined and quality checked prior to being loaded on the selected platform.

This difference in the amalgamated billing systems was demonstrated by the City of Cape Town being a property driven system which meant that the consumer and other account information is linked to a verified property. The other amalgamated systems were debtor driven; this meant that their data structure focused on the consumer. This underlying differences resulted in a number of data structure differences at field and sometimes table level of the respective databases.

(v) *Processing changes* : *The effect the system change has on the underlying business processes. Additions /subtractions.*

The Case Study presented evidence that the process changes that were initiated as part of the project were not necessarily as a direct result of the Restructural Change. The literature review suggested that there would be some new processes introduced however, in reality the processes remained the same and the improvements were general improvements that could have been called for during maintenance or new developments.

An example of where there was a change in processing was with the inclusion of the IKAPA accounts. The project called for the addition of functionality with respect to the “parking” of arrears. Parked arrears are non payments of accounts generated prior to June 1997 and were considered parked (no action to be taken on those accounts) by the political leaders.

Although the above is an example of where functionality had to change it was concluded that functionality changes were not mandatory (as parked arrears was considered a special situation). A slight amendment was required to the IS Change Framework to reflect this

situation.

(vi) *Time to implement change* : *The duration of the system change project.*

The concept of project timing in this instance refers to the time taken to complete the Restructural Change project. In the case study the overall project duration is considered the time taken to implement the Restructural Change.

The timing of a Restructural Change project is normally difficult to determine upfront as no change can be made until the political decisions, directing the change, are ratified. However, once the decisions have been ratified, through Parliament or Executive Committee, then the Restructural change is often expected to be implemented immediately.

It was also discovered, during the case study, that it is not a good idea to endeavour to pre-empt these ratifications as they can be changed at any stage whilst awaiting approval. The reason for this is that there are many different approval procedures for the Restructural Change project (boards, committees etc.) and changes can be initiated at any level. An example of where incorrectly pre-empting decisions could negatively impact the Restructural Change project is an attempt to decide upfront what package should be selected for final implementation. If the incorrect package is chosen, ie. the unapproved package, then a large amount of time and effort could be lost.

The information obtained from the case study supported what was stated during the literature review in respect of the Information System Change Framework. The framework called for the Restructural Change to be implemented in a short period and this was consistent with what was required of the New Billing Project. The reasons given during the formal interviews for the shortness in project duration was that there was a perception that a lengthy change period could have a negative impact on the amalgamated staff and provide a negative perception to the consumers of the newly formed organisation.

(vii) *Organisation Level* : *What level of the organisation is affected; operational, tactical, strategic.*

The New Billing Project Case Study further demonstrated that changes to organisations that resulted from a Restructural Change affected all aspects of each organisation including operational, tactical and strategic aspects. This was further supported by the fact that at Pinelands, IKAPA and Crossroads organisational changes were made at all levels within the organisation. This is demonstrated by Table 8 below.

Level / Organisation	IKAPA	Gross Roads	Pinelands	Cape City Council	Amalgamated City of Cape Town
Councillors (Strategic)	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Re-elected
Management Staff* (Tactical)	✓✓	✓✓	✓✓	✓✓	Reapplied for posts
Clerical Staff* (Operational)	✓	✓	✓	✓	Integrated
* This is true for staff who were associated with the billing function and is used to demonstrate the concept of Organisational Change.					

Table 8 : Organisational Change in the New Billing Project

A “✓✓✓”, “✓✓”, “✓” is used to denote that one or more instances of the situation was recorded.

Table 8 reflects the three different organisation levels in each of previous local authorities. The first are the Councillors who equate to a board of directors in a private organisation and who are the political decision makers. The members are also regarded as the strategic level of the organisation. As a direct result of the Restructural Change these members had to stand for re-election and there was fewer positions available as a result of the amalgamation. This clearly demonstrated the need for organisational change at the highest level after Restructuring. The total number of Councillors was reduced by over half of what was originally required prior to amalgamation.

The second level in the organisation hierarchy to be affected was the managerial level. Each of the previous local authorities had their own management structure which was dissolved with the implementation of the Restructural Change. Managers had to re-apply for a similar position within the newly created amalgamated local authority. There was a limited number of positions available and the remainder of the management staff were either retrenched or had to apply for positions at other local authorities. This process clearly demonstrated that there was an affect at the management or tactical level of the organisation as a result of the Restructural Change.

The third and final level of the amalgamated organisations hierarchy is the clerical or operational level. This level of each organisation was also affected by the Restructural Change in that the clerical staff of the previously autonomous local authorities were transferred to the amalgamated City of Cape Town.

The case study supported what was said in the literature review and as a result no amendment to the Information System Change Framework was required. It was clear from the case study that all levels of the organisation are affected by Restructural Change.

(viii) *Source of Change* : *Where the change originated in terms of the organisation's hierarchy.*

The source of the change, as established during the case study was as anticipated. This was at the corporate level. The change was originally initiated by the national Local Government Negotiating Forum who appointed transitional committees to oversee the Restructural Change. These committees were made up of Councillors from the various (soon to be amalgamated) local authorities who provided direction to the recently appointed senior managers of the City of Cape Town. Once again it needs to be stressed that although this project was deemed of the highest importance it did not originate from a long term strategic plan.

The project organisation reflected this situation as the project sponsor of the project was the Executive Director : Corporate Finance. The project board consisted of senior staff including directors and managers. The source or how the project originated was considered unusual for an IT implementation in that it did not originate from an IT Strategic Plan and unlike most other IT implementations was not placed under the direct control of the Information Technology Directorate.

The case study supported what was said in the literature review, that this project originates or is sourced at the highest level of an organisation and as a result no amendment to the Information System Change Framework was required.

(ix) *Risk / Cost of change* : *The cost of implementing such a change and the risk associated with that change.*

The New Billing Project Case Study did not demonstrate in any way a difference between a Restructural Change project and a similar sized IS Change in a different category, in terms of being higher or lower in cost. It was apparent from the interviews that this project was not considered, by the users and project team, as being any more costly than other similar sized IS changes in any other category.

There was a major difference to other IS classes in terms of the risk to the organisation if the Restructural Change project failed. Unlike in a new development, for example, which replaces an existing, possible outdated, system in a single organisation, the Restructural Change project replaces multiple established systems to form a single large application for the amalgamated organisation. The interviewees felt there were more inherent risks in this type of implementation than in the other classes of IS change mainly due to the fact that the newly established organisation would be put in a bad light if the project failed. This case study demonstrated this fact very clearly in that (all the respondents agreed) if the new billing project failed, the consumers from the amalgamated local governments would have claimed

that no amalgamation should have taken place.

There is a resulting amendment which calls for a change to the Information System Framework. The characteristic will be referred to as the Risk of Change and not Cost.

(x) *IS Service provider affected* : *The effect this change has on the IT department or the department providing the computer services.*

It was evident for the case study that there was a change in IS service provider which resulted directly from the Restructural Change Project. This was proven by the Pinelands, Crossroads and IKAPA technical billing infrastructures being taken over by CCT's Directorate of Information Technology Services (DITS).

The Pinelands, Crossroads and IKAPA technical billing infrastructures were being maintained by separate outsourced companies prior to their amalgamation with the in-house technical directorate of the CCT.

The case study supported what was said in the literature review, regarding how in a Restructural Change project there normally is a change in the IT service provider, and as a result no amendment to the Information System Change Framework was required.

(xi) *Environment Change* : *Any change to the physical environment.*

It was evident for the case study that there was not only a change in IS service provider, which resulted directly from the Restructural Change Project, but a change in the IS Environment as well.

This was demonstrated by the Pinelands, Crossroads and IKAPA's IT infrastructures being taken over and maintained by the DITS and all future equipment conforming to the standards

laid down by the DITS.

A further issue with regard to the Environment Change was that the data and machines were moved from their locations to a central location at the CCT. The amalgamated local authorities then became satellite offices linked via WAN to the central system.

The case study supported what was said in the literature review and as a result no amendment to the Information System Change Framework was required.

(xii) *Amalgamated Systems* : *The need to join more than one application system on offer that provides the same functionality.*

One of the main characteristics in the IS Change framework that differentiates Restructural Change from other types of IS changes is that Restructural Change is characterised by a predefined number of systems available for implementation as the final system. To further explain, Restructural Change often results in the combination of one or more established systems to form a single system to serve the newly amalgamated organisation.

This was clearly demonstrated in the New Billing Project Case study where there were three different, yet adequately functioning, billing systems. In Restructural Change, unlike the other IS System changes, it was observed that an extremely strong motivation would have been needed to select a new system over one of the existing three. These candidate systems each offering similar functionality had to be amalgamated as part of the Restructural Change. The set of candidates has been referred to as “Amalgamated Systems”.

The choice of which candidate system to use for final implementation also added a different dimension to the case study, in that the “best” system did not necessarily have to be chosen as there were other factors to consider when making the final selection for implementing the

Restructural Change.

Often, especially in the IS Change New Development, the “best” system is defined in terms of functional fit, user interface, cost of ownership etc. In the situation of Restructural Change it is not always possible to do a straight comparison between the various candidate systems as other factors are deemed important such as; where the majority of data resides, infrastructure availability, number of users that need to be retrained etc.

This is clearly demonstrated in the case study by the example of the Pinelands billing system which was a functioning system yet could not seriously be considered as it contained less than 2% of the overall final data set loaded, it did not make sense to move the 98% other data to that platform. Further, most of the future users (once the Restructural Change project was complete) were not familiar with the Pinelands application package.

The data volume ratio for the IKAPA system was a little better however, the obvious choice in this case study remained the use of the much larger Cape City Council billing system.

No change was made to the Information System Change Framework however, the characteristic Amalgamated Systems will prove very interesting if two or three similar sized systems are affected by a Restructural Change exercise. The reason for this is that a formal analysis of each candidate system would have to be done and compared to the requirements of the amalgamation.

5.2.2 Final Information System Change Framework

The introduction of Restructural change as a separate class of information system change was verified by applying it to the system change framework in a case study environment. Most of the characteristics of the “Restructural Change” class were different to the other classes which leads to the conclusion that it is a distinct class in the spectrum of IS changes. The Restructural Change concept is placed in the finalised Information System Change Framework in Table 9.

Characteristics	Maintenance	New Development	Tactical Change	BPR	Restructural Change	Disaster Recovery
Planning of Change	Limited, if any	Derived from Strategic Plan Operationalised	In Strategic Plan Operationalised	In Strategic Plan Operationalised	Not Strategic Commanded	No specific planning
Number of Systems Affected	One	One	Some or all	Some or all	All	All
Motivation for Change	Change in requirement	New requirement	Reduce costs	Improve profit overall process	Business structure Change	Survival
Data changes	Data not affected	New Data	Data not affected	Focus on better utilisation of data	New Data / Change Data	Data needs to be recovered
Processing changes	Process amended	New Process	Same Process only managed differently	Complete revision of processes	New / Same Revised Process	Same process to be recovered
Time taken to implement change	Short period	Medium term	Long Term	Long Term	Short period	Short Period
Organisation level	Operational	Operational, Tactical	Tactical, Strategic	Tactical, Strategic	All Levels	All levels
Source of Change	Division	Departmental	Corporate	Corporate	Corporate	Corporate
Risk of change	Low	Medium	High	High	High	High
IS Service provider change	Not	Not	Yes	Maybe	Yes	Not
Environment Change	No	No	Maybe	No	Yes	Yes
Amalgamated Systems	None	None	None	None	Yes	None

Table 9 : Information System Change Framework - Final Version

5.2.2.1 Discussion of Differences between Literature Review and findings of the Case Study

There were some differences to the Information System Change Framework as established during the literature review, and presented in Table 5, when compared to the final refined framework presented, in Table 9, after the findings of the case study. These differences are annotated in Table 9 by “” and are briefly discussed below.

(i) Planning of Change

It was initially thought in the literature review that Restructural Change is a volatile type of IS change that could not accurately be planned. The case study demonstrated that this was an incorrect assumption and that detailed plans could be created once the exact nature of the restructuring had been established. It was noted that high level or strategic planning was not possible with this type of IS change. The term “commanded” means that a plan had to be established and not necessarily from the overall IS strategic plan. The other types of changes, Development, Tactical, BPR were “operationalised” or put into action based on the strategic plan.

(ii) New / Same / Revised Processes

The literature review suggested that the business processes affected by the Restructural Change would be revised and possibly new processes added. During the case study it was found the certain processes remained completely unchanged and merely managed a higher volume of data.

(iii) Risk of change

This particular difference from the IS change frame work presented in the literature review is not in terms of the perceived and actual result but with respect to the antecedent itself. It was discussed that the risk and associated cost of the Restructural Change would be a factor that differentiated it from other classes of IS change. The results of the case study indicated that the risk is a differentiating factor however, the cost of Restructural Change is no different to that of other IS change classes.

5.2.3 Development Techniques for Restructural Change

5.2.3.1 Overview of Restructural Change Implementation

The second hypothesis presented earlier in the research stated that:

“ *Typical system development approaches, which are currently used and deemed appropriate for conventional IS change are inadequate for implementing Restructural Changes in an organisation.* ”

From the case study it was established that traditional modelling techniques were used to some extent and when applied they were utilised differently so as to achieve slightly different purposes. The reason for this is possibly best illustrated by means of a comparison between the development approach used in the change class New Development versus that used in Restructural Change.

When researching the development techniques for new system developments authors such as Silver & Silver (1989), Licker (1997), Callon (1996) Laudon & Laudon (1991) and Lay *et al* (1993) all work from the premise that there is a business problem that needs to be analysed. Once the business problem is understood a utopia type solution can then be modelled from which the new system can be built within prevailing organisational infrastructural constraints.

In Restructural Change (where, for example one organisation's system is amalgamated into another), the proposed solution is already in existence. Unfortunately the proposed solution may not be as flexible as a modelled solution in the design phases as in the new development scenario. It follows that in the Restructural Change Information System Class the focus is on how to establish and resolve the differences between the system to be amalgamated, termed the “source” system versus the amalgamating system termed, the “destination” system.

It was clearly established in the case study that once the differences between the soon to be obsolete source and prevailing destination system have been modelled, these differences have

to be resolved before the migration from source to destination can take place. The steps in implementing a Restructural Change project can therefore be considered different to those of the traditional System Development Life Cycle(SDLC) as presented by Silver and Silver (1989, 51 - 59).

A tabular comparison, table 10, is made using the SDLC as depicted by Silver and Silver versus the development method used in the case study has been compiled to reflect the situation.

Restructural Change Implementation Life Cycle		New System Development Life Cycle	
Phase Name	Basic Description	Phase Name	Basic Description
Analyse Source	Examine and model the source system	Planning Phase	Recognise, diagnose and define the problem
Specify Destination	Examine and model the destination system	Analysis Phase	Review the in-place system
Extract from source	Extract the relevant information from the source system		
Customise Destination	Where possible change the destination system		
		Design Phase	Model the elements of the new or improved system
Customise Destination	Where possible change the destination system	Development Phase	New system is built
Convert System	Convert from source to destination and run destination	Implementation Phase	Changeover to new or improved system
Re-skill and Decommission	Re-skill staff and decommission source system		

Table 10 : Restructural Change Versus Application Development

There are distinct differences between the two development approaches. These include the analysis of two systems in Restructural Change as opposed to the current system in the traditional SDLC. In the SDLC a new or improved system is required to be purchased or built, this is not necessarily the case for Restructural Change as the solution is already in existence.

An additional phase in the Restructural Change Implementation Life Cycle is the Re-skilling and integration of staff as well as the decommissioning of the source systems. Each phase and the results of the case study will be discussed in detail below.

5.2.3.2 Restructural Change Development - Findings of the case study

Full details of the various modelling techniques used will not be discussed; however, an overall explanation of the development method will be provided. Further, observations as to the differences in the overall development approaches will be appraised. This is not a definitive examination of the development techniques required for Restructural Change but attempts to describe observations made during the case study.

The findings of the case study were extrapolated from formal interviews held with, among others, the project manager and various development team members (See Section 5.3 of the Detailed Questionnaire in Appendix A). Further information on the development approach was obtained by studying project documentation and by direct observation.

From the information gathered it was clear that a Restructural Change project, much like other types of IS Change projects, can be split into distinct sections these have been referred to as Phases. The case study demonstrated that there are six phases which make up the entire development or implementation cycle for a Restructural Change Project. The phases of the Restructural Change Implementation Life Cycle are presented and briefly described in Table 11. A further more detailed explanation quoting examples from the case study is provided below.

Restructural Change Implementation Life Cycle		
Phase No	Phase Name	Basic Description
1	Analyse Source	Examine and model the source system
2	Specify Destination	Examine and model the destination system
3	Extract from source	Extract the relevant information from the source system
4	Customise Destination	Where possible change the destination system
5	Convert System	Convert from source to destination and run destination
6	Re-skill and Decommission	Re-skill staff and decommission source system

Table 11 : Restructural Change Development Phases

(i) Analyse Source

This phase called for the detailed analysis of the various systems that were required to be transformed as a result of the restructuring process. It was deemed important to understand what information was being stored in these systems and what functionality they were currently providing. At the end of this phase it was agreed which of the candidate systems would form the final destination application. In the New Billing case study as depicted in Figure 7 there were four systems that had to be analysed.

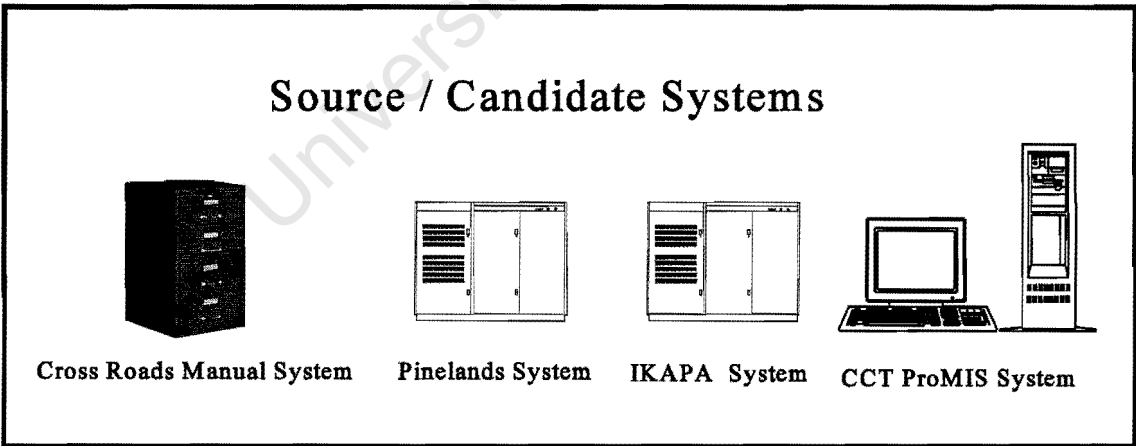


Figure 7 - Various source systems for the New Billing case study

(ii) Specify Destination

Once a candidate system had been selected as the preferred system then a detailed specification of the technical infrastructure, data layouts and business rules needed to be

documented and agreed as the “Destination Standard”.

In the case study the CCT’s ProMIS billing system was agreed as the preferred system and the remaining applications had to be converted to the specification agreed for ProMIS.

(iii) Extract from source

Once the agreed system had been selected and specified the next phase was to extract the relevant information from the remaining (non selected) source systems. There was a requirement to write extract programs to extract the necessary data from the respective source systems.

In the case study the suppliers of the original source systems for Pinelands and IKAPA were asked to write extract programs in order for the relevant consumer and property data to be made available for loading into the ProMIS application. A separate data capture exercise was performed for the Cross Roads manual system.

(iv) Customise Destination

The selected destination system needed to be amended, to an agreed extent, to accommodate the data and other requirements of the various non-selected source applications.

The ProMIS application underwent a number of minor enhancements specified in order to cater for the requirements of the loaded data and associated rules. One such accommodation was the creation of a “parked arrears” facility that was mandatorily required in the IKAPA system and not catered for in the original ProMIS application.

(v) Convert System

Once the extractions had taken place and the destination systems had been prepared the conversion process took place. Areas of concern was the timing of the conversion for example the last billing on the old system and before the next monthly billing on the new system.

A diagrammatic representation of the conversion process for the New Billing Project is provided in Figure 8.

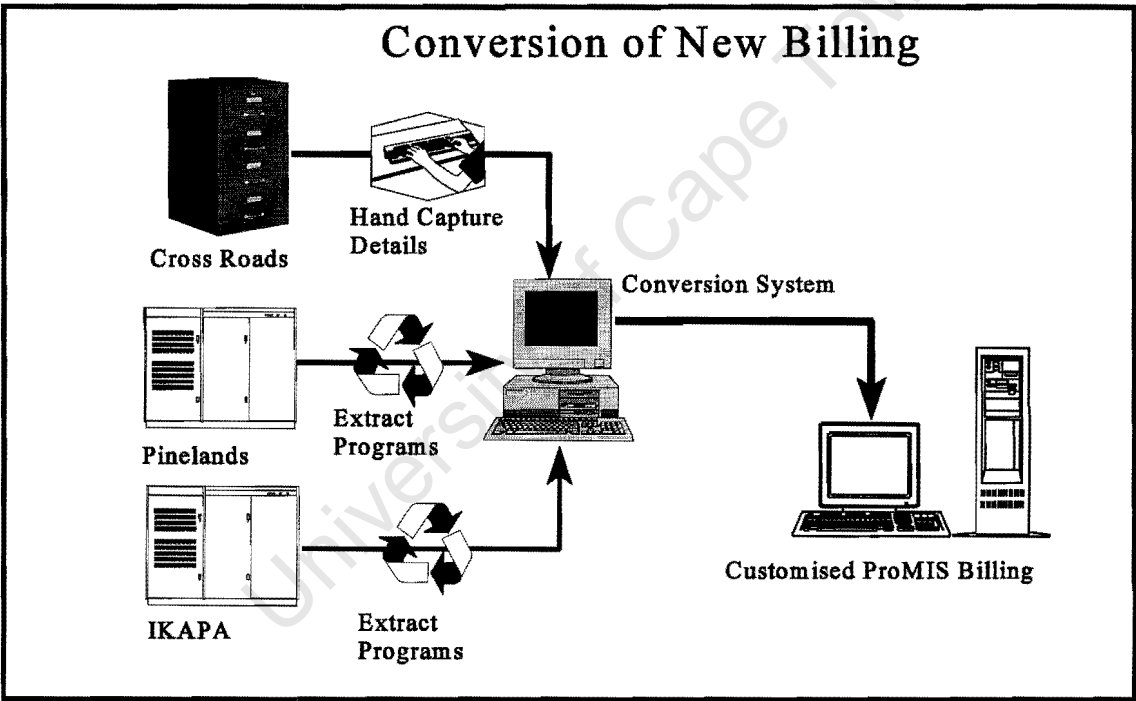


Figure 8 - Conversion of the New Billing System

(vi) Re-skill and Decommission

The final phase of the Restructural Change Project was to provide the necessary training for administration staff that had been reallocated to work on the selected system. Further, as in the case study for the New Billing project, to decommission the remaining systems and ensure that there is access to those systems for historic information purposes.

5.2.3.3 Conclusion

The development approach for a Restructural Change project differs in a number of respects to that of other IS change classes as previously defined. For comparison purposes that Restructural Change Implementation Life Cycle established during the New Billing Project case study was compared to the System Development Life Cycle often used in the IS change class called New Development. It was noted that there are a number of differences between the development approach needed for the implementation of a Restructural change information system and the development method normally associated with developing of new systems.

This further supports the assertion that Restructural Change is a unique IS class.

5.3 FINDINGS WITH RESPECT TO THE HYPOTHESES

5.3.1 H1 - Restructural Change as a new information system change class

From the results described above, it is clear that among the different categories of information system change, a further unique category Restructural Change can be added.

5.3.2 H1 -Development approach for Restructural Change

From the results described above, typical system development approaches, which are currently used and deemed appropriate for conventional IS change can be considered inadequate for implementing Restructural Changes. The results however, are not completely conclusive and the method suggested (Restructural Change Implementation Life Cycle) requires further verification and testing.

CHAPTER 6 : CONCLUSION

6.1 GENERAL

There are many political, economic, socio-cultural or technological factors that can trigger varying degrees of change to an organisation. Each type of change can affect some or all components of an organisation. The components of an organisation are defined, at a high level, in terms of the organisation's culture, structure and systems. One of the vital sub-components of an organisation's systems are the information or computer based systems. Organisations, undergoing change, are becoming increasingly dependent on information systems and therefore there is a need from an IS development perspective to respond to the change in a suitably controlled manner in order to effect the change without compromising any aspect of that organisation.

A framework for undertaking this IS change is vital to ensure that the specific mechanism to effect the change is responsive enough so as to ensure that the organisation survives or hopefully thrives on the particular change.

A framework was established using a literature based review of contemporary authors' views on related topics to IS change. Further, research identified a possible gap in the literature with respect to what was later referred to as Restructural Change. A Restructural Change to an information system happens when the organisation undergoes a radical transformation which affects all aspects of that organisation. Typical examples of events that cause a Restructural Change include mergers, unbundling etc.

Restructural Change is one of many types of IS change classes and to place it in context with these other classes a diagram Figure 9 has been outlined to place Restructural Change in context with other IS change types. The diagram is explained below.

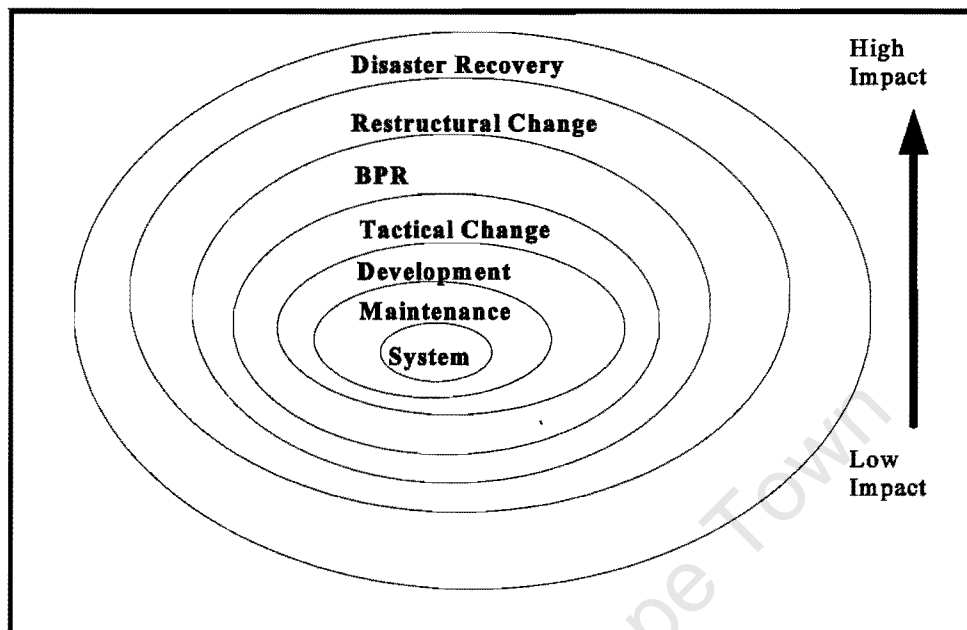


Figure 9 : Spectrum of Information System Change

As represented in Figure 9 the change is effected against a **system**. This change could merely be enhancing or **maintaining** that core system to accommodate the change. This would normally be as a result of a relatively low impact change to the organisation as reflected by the arrow.

If the change had a higher impact on the organisational system it could call for the **development** of an entirely new system. The change may be of such a nature that the organisation is forced to redefine its technical strategy calling for a **tactical change**. The impact of the change could force the organisation to review the underlying business processes supported by the core system resulting in a **BPR** type change. The change could mean an amalgamation of organisations, this would result in a total structure change within the organisations forcing a **Restructural Change**.

Finally the change can be of such a nature that the organisation is, through **disaster**, forced to rebuild its entire set of core systems. This change would be the result of the highest possible level of change. A change which forces the organisation to implement disaster recovery is considered the highest impact change as reflected by the arrow in Figure 9.

Restructural Change calls for a development approach which differs from the more traditional methods prescribed by the standard SDLC. The suggested Restructural Change Implementation Life Cycle approach is based on the assumption that there is more than one core system offering the same functionality and only one of those systems will be the selected (destination) system. This means that as opposed to the development of a core system, a selection, amendment and conversion set of exercises need to take place.

Restructural Information System Change is a new generic class of information system change that differs to other IS change types such as BPR and New Development and is brought about through major changes to an organisation such as mergers and unbundling. These are high risk projects characterised by the need to amalgamate similar systems across organisations.

6.2 LIMITATIONS OF THE STUDY

This survey was based on a single case study and is subject to the limitations of such a study. The study was undertaken in a Local Government environment which may have influences that are not applicable in the private or other government sectors.

6.3 AREAS FOR FUTURE RESEARCH

There are a number of areas for future research. Firstly, in the area of Information System Change the framework introduced as part of this research needs to be further tested and possibly refined after more in depth research. The various characteristics identified in the research, which were used to define each class of information system change, need to be further verified by means of more detailed quantitative research.

The concept of a Restructural Change Implementation Life Cycle needs to be further refined and tested in a number of different business areas.

The concept of Restructural Change will once again come to the fore in Local Government in the Western Cape as the final phase of local government transition is currently underway. The Western Cape's six substructure local authorities are scheduled to be combined into one large "mega city" by 2001.

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5.1.2	What type of skill set was required, by the project team, for the implementation of the New Billing Project ? Were these any different to those found on most IT project teams ?
5.1.3	In your experience, are most IT projects unique and if so what makes them unique ? Does this uniqueness make a difference and was this demonstrated, in any way, during the New Billing System project ?
5.1.4	Have you ever tried to group the implementation of IT projects into different classes or groupings ? Using the last four IT projects as a basis for providing information please provide details. Where would you slot in the Billing Project ?
5.1.5	<p>Are there, in your opinion, different approaches (<i>approach</i> being defined as the method or techniques which the management and project team used to analyse, implement and test the project) to implementing IT systems depending on certain circumstances (<i>circumstance</i> being defined as any constraining factors such as budget, time or Council standards)?</p> <p>Was the new Billing Project Different and in what way assuming that there are different approaches used in different circumstances ?</p>
5.1.6	<p>Are some IT implementations generally more difficult to plan and budget for (in terms needing more resources and management commitment) than others ?</p> <p>Was this the case for the New Billing Project ?</p>

5.2 Validate Restructural Change concept :

No.	Questions
5.2.1	What level and kind of planning was undertaken on this project. Outline the quality of planning in your opinion ?
5.2.2	<p>How much notice of the impending business changes was given by the political decision makers?</p> <ul style="list-style-type: none">- And how was notice given?- What detail of change was announced?- Were reasons given?- Which reasons?- Were they clear and did they make sense?- Were you prepared for this announcement? How?
5.2.3	Apart from the Billing System were any other systems changed as a result of the Western Cape Local Government restructuring ?

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.4	If more than one system was affected, did this have any impact on the New Billing System ? In terms of poolable resource allocation, such as networking staff ?
5.2.5	Describe, from your perspective (the interviewee) the motivation for the New Billing Project ?
5.2.6	Would the project have been necessary, or possibly have the same importance, if Western Cape Local Government restructuring had not taken place ?
5.2.7	In your opinion did the billing system data have to change in any way to accommodate or as a result of the New Billing Project ?
5.2.8	Could you provide some examples to support the above statement ?
5.2.9	In your opinion did the underlying billing system functionality have to change in any way to accommodate or as a result of the New Billing Project ?
5.2.10	Could you provide some examples to support the above statement ?
5.2.11	Were the time frames for this project a restricting or constraining factor and if so what made them so important ?
5.2.12	Were any organisational changes required as a result of this project ?
5.2.13	Specify, at what level(s) of the organisational structure, where the change occurred as a result of this project
5.2.14	At what level was the project sourced ie. initiated ?
5.2.15	Was the cost of this project higher than other IT projects, is so what were the reasons for this ?
5.2.16	Were the risks identified in not completing this project any higher than those of other IT projects and if so how ?
5.2.17	Were the risks managed any differently in this project, please give examples ?
5.2.18	Were there any changes in the IS Service provider as a result of this project ?
5.2.19	Was there any change, that you can identify, in the IT Environment caused as a direct result of this project ?
5.2.20	Were there any duplicated systems ie. Were there any systems which offered the same major functionality ?

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.21	<p>How was the selected application system, hardware and software chosen for this project ?</p> <ul style="list-style-type: none">- Were the decisions made different to those of other IT implementations ? <p>Examples being : Hardware and Software already existed and only one set had to be chosen to effect the Restructural change.</p>
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5.3 Investigate the modelling of Restructural Change :

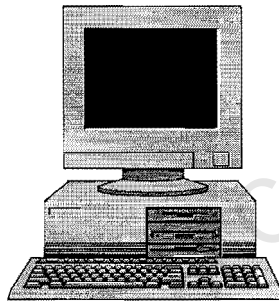
No.	Questions
5.3.1	What system modelling techniques and methods were used in the new Billing Project ?
5.3.2	Were these methods affective in modelling all aspects of the project and if not why not ? What indications were there that make you draw your conclusions ?
5.3.3	Was the system modelling of this project different to that of other IT projects, such as a new development etc ?
5.3.4	How was the aspect of change (as brought about by the restructuring exercise) modelled ?
5.3.5	List, in your opinion, the strengths of the modelling techniques used ?
5.3.6	List, in your opinion, the weaknesses of the modelling techniques used ?
5.3.7	Would you model or analyse this project in the same way if you had to do a similar project again ?

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Appendix B

Interview Notes

Masters Disseration on Restructural Change



Detailed Questionnaire - Restructural Change

1. **Interview Details**

Name of Interviewee : Francien Potgieter

Position : Project Manager

Area of responsibility in New Billing Project :

Project Manager responsible for the implementation of Stages 2 and 6

2. **Date:** 24 August 1999

3. **Purpose :**

The purpose of this questionnaire is to interview various key persons involved in the implementation of the New Billing System at the City of Cape Town. This project is being used as a Case Study for research performed by Roland Amm as part of his masters dissertation.

4. **Context :**

The context of the questionnaire is limited to the scope of the masters dissertation which has the broad subject area of Information System (IS) Change as its focus and attempts to introduce a more specific sub-area of change referred to as "Restructural Change".

5. Questions :

5.1 Support for the Establishment of Information System Change Categories :

No.	Questions
5.1.1	<p>How did the New Billing System project compare to other Information Technology (IT) projects implemented at the City of Cape Town ? The comparison should be made in the following context :</p> <ul style="list-style-type: none"> - Was the project initiated any differently ? <i>The project manager was not consulted during the project initiation.</i> - Were the project objectives driven mainly by business or political needs ? <i>It was agreed that the project came about mainly due to the political needs caused by the Western Cape Local Government Restructuring.</i> - Was the priority, from the user perspective, of the project more or less then similar sized IT projects ? <i>It was said that this project had a higher priority then normal.</i> - Was the project initiated from a long term strategic business plan ? <i>No.</i> - Did you notice any other differences in terms of this project being measured against other similar sized IT implementations ? <i>Yes, the timescales and budget were fixed more so then other assignments. There was more "hands on" project management involvement. More varied skills required by the Project Manager.</i>
5.1.2	<p>What type of skill set was required, by the project team, for the implementation of the New Billing Project ? Where these any different to those found on most IT project teams.</p> <p><i>A combination of technical and business skills were required for this project. This is the same in most IT projects however, more business skills were required for this project due to a need to mange the change.</i></p>
5.1.3	<p>In your experience, are most IT projects unique and if so what makes them unique ? Does this uniqueness make a difference and was this demonstrated, in any way, during the New Billing System project ?</p> <p><i>Projects are unique. I have been involved in a number of projects such as maintenance, new development package implementation etc. What differentiates these projects especially the New Billing System is the skill set required to implement the project.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.1.4	<p>Have you ever tried to group the implementation of IT projects into different classes or groupings ? Using the last four IT projects as a basis for providing information and please provide details. Where would you slot in the Billing Project ?</p> <p><i>Groupings can be made on a variety of criteria including volumes, complexity etc.. This project was focused but had high volumes.</i></p>
5.1.5	<p>Are there, in your opinion, different approaches (<i>approach</i> being defined as the method or techniques in which the management and project team used to analyse, implement and test the project) to implementing IT systems depending on certain circumstances (<i>circumstance</i> being defined as any constraining factors such as budget, time or Council standards)?</p> <p><i>There are different approaches and methods to be used in different projects.</i></p> <p>Was the new Billing Project Different and in what way assuming that there are different approaches used in different circumstances ?</p> <p><i>There was no formal method used in this project mainly due to the different nature of the project.</i></p>
5.1.6	<p>Are some IT implementations generally more difficult to plan and budget for (in terms needing more resources and management commitment) then others ?</p> <p>Was this the case for the New Billing Project ?</p> <p><i>The project manager in question was not involved in the budgeting process.</i></p>

5.2 Validate Restructural Change concept :

No.	Questions
5.2.1	<p>What level and kind of planning was undertaken on this project. Outline the quality of planning in your opinion ?</p> <p><i>Only very high level planning was used as there were too many constraints and unknowns in this particular project.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.2	<p>How much notice of the impending business changes was given by the political decision makers?</p> <ul style="list-style-type: none"> - And how was notice given? - What detail of change was announced? - Were reasons given? - Which reasons? - Were they clear and did they make sense? - Were you prepared for this announcement? How? <p><i>Project manager was not involved in this early aspect of the project. The project manager was given a high level specification by the Senior Project Manager.</i></p>
5.2.3	<p>Apart from the Billing System were any other systems changed as a result of the Western Cape Local Government restructuring ?</p> <p><i>Yes both internally to the City Council such as Payroll and externally such as the other different municipalities that were also undergoing restructuring eg. CMC, South Peninsula, Blaauberg, Oostenberg etc.</i></p>
5.2.4	<p>If more then one system was affected, did this have any impact on the New Billing System ? In terms of poolable resource allocation, such as networking staff.</p> <p><i>Yes, both internal and external resources were effected. A further complication was that a number of internal staff (both computer and admin staff) were redeployed as a result of the restructuring. This did have an impact on the project.</i></p>
5.2.5	<p>Describe, from your (the interviewee) the motivation for the New Billing Project ?</p> <p><i>There was a combination of business and political needs that drove this project. The political needs originated from the general local government restructuring that took place in the Western Cape. The business needs were focused on the need to provide the community with a consolidated bill.</i></p>
5.2.6	<p>Would the project have been necessary, or possibly have the same importance, if Western Cape Local Government restructuring had not taken place ?</p> <p><i>No, and the timescales would not have been so strict. An excellent example of this was the need to have the billing data of the CMC mainframe no later then June 1998.</i></p>
5.2.7	<p>In your opinion did the billing system data have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes, a number of data conversion and inclusions exercises were taken as part of this project.</i></p>
5.2.8	<p>Could you provide some examples to support the above statement ?</p> <p><i>Inclusion of the CMC data.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.9	<p>In your opinion did the underlying billing system functionality have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p>Yes .</p>
5.2.10	<p>Could you provide some examples to support the above statement ?</p> <p><i>The way the refuse and sewerage billing functionality was amended as a direct result of this project.</i></p>
5.2.11	<p>Was the time frames for this project a restricting or constraining factor and if so what made them so important ?</p> <p><i>Yes. This is again demonstrated by the fact that the deadline for incorporated CMC billing was July 1998. This deadline was a political milestone and not a business motivated decision.</i></p>
5.2.12	<p>Where any organisational changes required as a result of this project ?</p> <p><i>Yes, there were a number of organisational changes required. Two admin staff were moved from CMC to CCT.</i></p>
5.2.13	<p>Specify, at what level(s) of the organisational structure, where the change occurred as a result of this project.</p> <p><i>In this instance the changes were at a lowly administrative level.</i></p>
5.2.14	<p>At what level was the project sourced ie initiated ?</p> <p><i>This was started or initiated at the highest level. However, the actual "nuts and bolts" or mechanics of making this processes happen was managed at the business level.</i></p>
5.2.15	<p>Was the cost of this project higher then other IT projects, is so what were the reasons for this ?</p> <p><i>Not sure, there was no clear indication either way.</i></p>
5.2.16	<p>Were the risks identified in not completing this project any higher then those of other IT projects and if so how ?</p> <p><i>Yes there were a number of high risks including recent legislation and public opinion. This was compounded by a large amount of uncertainty.</i></p>
5.2.17	<p>Were the risks managed any differently in this project, please give examples ?</p> <p><i>No, the management of the risk was much the same.</i></p>
5.2.18	<p>Were there any changes in the IS Service provider as a result of this project ?</p> <p><i>Yes, as far as the support of the billing was concerned.</i></p>
5.2.19	<p>Was there any change, that you can identify, in the IT Environment caused as a direct result of this project ?</p> <p><i>Yes, in the package and infrastructure used for billing the CMC accounts.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.20	<p>Were there any duplicated systems ie. Were there any systems which offered the same major functionality ?</p> <p><i>Yes, both Logical and ProMIS are competing products.</i></p>
5.2.21	<p>How was the selected application system, hardware and software chosen for this project ?</p> <p>- Were the decisions made different to that of other IT implementations ?</p> <p><i>Yes, normally there is a selection process to chose the best system and infrastructure. In this instance one was already provided. The IT infrastructure was provided and not chosen as part of this project.</i></p> <p>Examples being : Hardware and Software already existed and only one set had to be chosen to effect the Restructural change.</p>

5.3 Investigate the modelling of Restructural Change :

No.	Questions
5.3.1	<p>What system modelling techniques and methods were used in the new Billing Project ?</p> <p><i>No formal modelling techniques were used. However, documentation of system differences and other business issues was undertaken.</i></p>
5.3.2	<p>Where these methods effective in modelling all aspects of the project and if not why not ?</p> <p><i>There were effective to the extent that the project was a success.</i></p> <p>What indications were there that make you draw your conclusions ?</p> <p><i>The success of the project.</i></p>
5.3.3	<p>Was the system modelling of this project different to that of other IT projects, such as a new development etc ?</p> <p><i>Yes, normally a specific or prescribed methodology is used.</i></p>
5.3.4	<p>How was the aspect of change (as brought about by the restructuring exercise) modelled ?</p> <p><i>It was modelled in the construction of conversion programs. Some documentation was made.</i></p>
5.3.5	<p>List, in you opinion, the strengths of the modelling techniques used ?</p> <p><i>Own, understandable and applicable to the task at hand.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.3.6	List, in you opinion, the weaknesses of the modelling techniques used ? <i>Not formal or rigid in anyway. Difficult to quality assure and test.</i>
5.3.7	Would you model or analyse this project in the same way if you had to do a similar project again ? <i>Yes unless a better method can be found.</i>

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University of Cape Town

Detailed Questionnaire - Restructural Change

1. Interview Details

Name of Interviewee : Dave Charles

Position : Senior Systems Analyst

Area of responsibility in New Billing Project :

General project support and quality assurance.

2. Date: 24/08/1999

3. Purpose :

The purpose of this questionnaire is to interview various key persons involved in the implementation of the New Billing System at the City of Cape Town. This project is being used as a Case Study for research performed by Roland Amm as part of his masters dissertation.

4. Context :

The context of the questionnaire is limited to the scope of the masters dissertation which has the broad subject area of Information System (IS) Change as its focus and attempts to introduce a more specific sub-area of change referred to as "Restructural Change".

5. Questions :

5.1 Support for the Establishment of Information System Change Categories :

No.	Questions
5.1.1	<p>How did the New Billing System project compare to other Information Technology (IT) projects implemented at the City of Cape Town ? The comparison should be made in the following context :</p> <ul style="list-style-type: none"> - Was the project initiated any differently ? <i>The project might have originated slightly differently but its formal initiation was the same.</i> - Were the project objectives driven mainly by business or political needs ? <i>A combination of business and political objectives drove this project.</i> - Was the priority, from the user perspective, of the project more or less than similar sized IT projects ? <i>The priority was high as it was necessary to complete this project.</i> - Was the project initiated from a long term strategic business plan ? <i>No.</i> - Did you notice any other differences in terms of this project being measured against other similar sized IT implementations ? <i>This project was unique in measurement. There were noticeable differences on how it was managed and the attitude and motivation of the individuals involved.</i>
5.1.2	<p>What type of skill set was required, by the project team, for the implementation of the New Billing Project ? Were these any different to those found on most IT project teams.</p> <p><i>This project team required a number of different skills for different reasons. Further, the project team had to be multitasked with a good combination of business and technical skills and these members had to adapt very quickly.</i></p>
5.1.3	<p>In your experience, are most IT projects unique and if so what makes them unique ? Does this uniqueness make a difference and was this demonstrated, in any way, during the New Billing System project ?</p> <p><i>All IT projects are unique one of the problems is that the benefits of them are hard to quantify.</i></p>
5.1.4	<p>Have you ever tried to group the implementation of IT projects into different classes or groupings ? Using the last four IT projects as a basis for providing information and please provide details. Where would you slot in the Billing Project ?</p> <p><i>No. All projects are treated as being unique and I cannot compare projects.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.1.5	<p>Are there, in your opinion, different approaches (<i>approach</i> being defined as the method or techniques in which the management and project team used to analyse, implement and test the project) to implementing IT systems depending on certain circumstances (<i>circumstance</i> being defined as any constraining factors such as budget, time or Council standards)?</p> <p><i>Yes. There are number of different approaches used with different methods.</i></p> <p>Was the new Billing Project Different and in what way assuming that there are different approaches used in different circumstances ?</p> <p><i>Cannot comment in this particular circumstance.</i></p>
5.1.6	<p>Are some IT implementations generally more difficult to plan and budget for (in terms needing more resources and management commitment) than others ? Yes, planning for IT projects is difficult and very often not very accurate.</p> <p><i>This situation is excacerbated by the fact that there are many unknowns in a project like the New Billing Project.</i></p> <p>Was this the case for the New Billing Project ?</p> <p><i>See above comment.</i></p>

5.2 Validate Restructural Change concept :

No.	Questions
5.2.1	<p>What level and kind of planning was undertaken on this project. Outline the quality of planning in your opinion ?</p> <p><i>Quality of planning was good in general. There was not too much detailed planning.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.2	<p>How much notice of the impending business changes was given by the political decision makers?</p> <ul style="list-style-type: none">- And how was notice given? <i>No formal notice was given, it is hard to say.</i>- What detail of change was announced? <i>No detail was provided.</i>- Were reasons given? <i>Only political reasons and very high level business motives.</i>- Which reasons? <i>Cannot comment on the exact reasons.</i>- Were they clear and did they make sense? <i>Cannot comment.</i>- Were you prepared for this announcement? How? <i>Cannot comment.</i>
5.2.3	<p>Apart from the Billing System were any other systems changed as a result of the Western Cape Local Government restructuring ?</p> <p><i>Mainly the payroll system.</i></p>
5.2.4	<p>If more than one system was affected, did this have any impact on the New Billing System ? In terms of poolable resource allocation, such as networking staff.</p> <p><i>There was some impact caused by other projects but the main impact was people leaving as a result of the restructuring process.</i></p>
5.2.5	<p>Describe, from your perspective (the interviewee) the motivation for the New Billing Project ?</p> <p><i>It was the finalisation of the consolidated billing assignment that had been ongoing for many year. Secondly, it was to incorporate various billing areas that were now included as part of the City of Cape Town.</i></p>
5.2.6	<p>Would the project have been necessary, or possibly have the same importance, if Western Cape Local Government restructuring had not taken place ?</p> <p><i>No, however there were many motivations to complete this project.</i></p>
5.2.7	<p>In your opinion did the billing system data have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes, there were a number of changes.</i></p>

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5.2.8	<p>Could you provide some examples to support the above statement ?</p> <p><i>Mainly the inclusion of areas such as Pinelands and IKAPA.</i></p>
5.2.9	<p>In your opinion did the underlying billing system functionality have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p>Yes.</p>
5.2.10	<p>Could you provide some examples to support the above statement ?</p> <p><i>The functionality changes required for the inclusion of the outlying areas.</i></p>
5.2.11	<p>Was the time frames for this project a restricting or constraining factor and if so what made them so important ?</p> <p><i>Yes, certain dates with respect to the financial years and new millennium had to be met. These dates were communicated to the political leaders and therefore were regarded as milestone dates.</i></p>
5.2.12	<p>Were any organisational changes required as a result of this project ?</p> <p><i>Yes. A substantial amount of changes were brought about as a result of the restructuring exercise.</i></p>
5.2.13	<p>Specify, at what level(s) of the organisational structure, where the change occurred as a result of this project.</p> <p><i>This happened at a number of different levels.</i></p>
5.2.14	<p>At what level was the project sourced ie. initiated ?</p> <p><i>This project was initiated at the highest possible levels.</i></p>
5.2.15	<p>Was the cost of this project higher than other IT projects, is so what were the reasons for this ?</p> <p><i>No, there was no indication that the cost was any higher.</i></p>
5.2.16	<p>Were the risks identified in not completing this project any higher than those of other IT projects and if so how ?</p> <p><i>Yes, the risks were higher as this project involved the generation of income for the CCT. Any danger to the process would have had a negative effect on the CCT as a whole.</i></p>
5.2.17	<p>Were the risks managed any differently in this project, please give examples ?</p> <p><i>No, the risks seemed to be managed in much the same way.</i></p>
5.2.18	<p>Were there any changes in the IS Service provider as a result of this project ?</p> <p><i>Yes, for certain of the effected areas there was definitely a change in IS service provider.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.19	<p>Was there any change, that you can identify, in the IT Environment caused as a direct result of this project ?</p> <p><i>Yes, for certain of the effected areas there was definitely a change in the IT environment.</i></p>
5.2.20	<p>Were there any duplicated systems ie. Were there any systems which offered the same major functionality ?</p> <p><i>Yes, Pinelands, IKAPA and the CMC all had systems which provided the same functionality.</i></p>
5.2.21	<p>How was the selected application system, hardware and software chosen for this project ?</p> <p><i>ProMIS or the billing system was already selected prior to the start of this project. Hardware was as given and no selection process was needed.</i></p> <p>- Were the decisions made different to that of other IT implementations ?</p> <p><i>Normally the application software is chosen during the project once the requirements have been finalised. In this project the software was already selected. This is unusual.</i></p> <p>Examples being : Hardware and Software already existed and only one set had to be chosen to effect the Restructural change.</p>

5.3 Investigate the modelling of Restructural Change :

No.	Questions
5.3.1	<p>What system modelling techniques and methods were used in the new Billing Project ?</p> <p><i>Standard methods SSADM and PRINCE were used to the best of the knowledge of the interviewee.</i></p>
5.3.2	<p>Were these methods effective in modelling all aspects of the project and if not why not ?</p> <p><i>No, the circumstances around this project made it difficult to apply the methodologies in their entirety.</i></p> <p>What indications were there that make you draw your conclusions ?</p>
5.3.3	<p>Was the system modelling of this project different to that of other IT projects, such as a new development etc ?</p> <p><i>Interviewee could not comment.</i></p>
5.3.4	<p>How was the aspect of change (as brought about by the restructuring exercise) modelled ?</p> <p><i>Interviewee could not comment.</i></p>
5.3.5	<p>List, in your opinion, the strengths of the modelling techniques used ?</p> <p><i>Interviewee could not comment.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.3.6	List, in your opinion, the weaknesses of the modelling techniques used ? <i>Interviewee could not comment.</i>
5.3.7	Would you model or analyse this project in the same way if you had to do a similar project again ? <i>Interviewee could not comment.</i>

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University of Cape Town

Detailed Questionnaire - Restructural Change

1. Interview Details

Name of Interviewee : Chris Nkonyana	Position : Senior Accountant
Area of responsibility in New Billing Project :	Previously managed the billing process for the incorporated area of IKAPA. Now a manager in CCT billing office.

2. Date: 04/10/1999

3. Purpose :

The purpose of this questionnaire is to interview various key persons involved in the implementation of the New Billing System at the City of Cape Town. This project is being used as a Case Study for research performed by Roland Amm as part of his masters dissertation.

4. Context :

The context of the questionnaire is limited to the scope of the masters dissertation which has the broad subject area of Information System (IS) Change as its focus and attempts to introduce a more specific sub-area of change referred to as “Restructural Change”.

5. Comment :

No formal interview was held with Mr Nkonyana due to timing pressures. However, informal discussions were held where the concept of Restructural Change was discussed and agreement reached that it could be seen as a different type of IS development.

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Detailed Questionnaire - Restructural Change

1. Interview Details

Name of Interviewee : Johan Conradie

Position : Business Project Manager

Area of responsibility in New Billing Project :

Overall responsibility for the entire project managing various project managers.

2. **Date:** 01 September 1999

3. Purpose :

The purpose of this questionnaire is to interview various key persons involved in the implementation of the New Billing System at the City of Cape Town. This project is being used as a Case Study for research performed by Roland Amm as part of his masters dissertation.

4. Context :

The context of the questionnaire is limited to the scope of the masters dissertation which has the broad subject area of Information System (IS) Change as its focus and attempts to introduce a more specific sub-area of change referred to as "Restructural Change".

5. Questions :

5.1 Support for the Establishment of Information System Change Categories :

No.	Questions
5.1.1	<p>How did the New Billing System project compare to other Information Technology (IT) projects implemented at the City of Cape Town ? The comparison should be made in the following context :</p> <ul style="list-style-type: none"> - Was the project initiated any differently ? <p><i>There were certain business needs that were to be completed, however the overriding consideration was that fact that certain political objectives IRO of restructuring had to be met.</i></p> <ul style="list-style-type: none"> - Were the project objectives driven mainly by business or political needs ? <p><i>Some business drivers but the project was essentially initiated by political motives.</i></p> <ul style="list-style-type: none"> - Was the priority, from the user perspective, of the project more or less than similar sized IT projects ? <p><i>Yes the priority was higher mainly due to the political sensitivity of the project.</i></p> <ul style="list-style-type: none"> - Was the project initiated from a long term strategic business plan ? <p>No.</p> <ul style="list-style-type: none"> - Did you notice any other differences in terms of this project being measured against other similar sized IT implementations ? <p><i>Not really however, the project had to be completed against strict timescales there was no room for slippage against the scheduled completion date.</i></p>
5.1.2	<p>What type of skill set was required, by the project team, for the implementation of the New Billing Project ? Were these any different to those found on most IT project teams ?</p> <p><i>The skills required by the project team were not only IT but skills such as HR and business skills were also required. There was an inherent lack of skill on the part of the organisation to integrate staff members into the single organisation structure.</i></p>
5.1.3	<p>In your experience, are most IT projects unique and if so what makes them unique ? Does this uniqueness make a difference and was this demonstrated, in any way, during the New Billing System project ?</p> <p><i>This project was managed differently to other project, in that various project managers managed. All aspects of this project had a high priority and all deadline dates were not negotiable.</i></p>
5.1.4	<p>Have you ever tried to group the implementation of IT projects into different classes or groupings ? Using the last four IT projects as a basis for providing information and please provide details. Where would you slot in the Billing Project ?</p> <p><i>Projects are differentiated on a number of levels, one such level is the understanding of the user of what he/she wants. In this case, a restructuring exercise, the users were not entirely clear as to exactly what they wanted and no detailed specifications were provided.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.1.5	<p>Are there, in your opinion, different approaches (<i>approach</i> being defined as the method or techniques in which the management and project team used to analyse, implement and test the project) to implementing IT systems depending on certain circumstances (<i>circumstance</i> being defined as any constraining factors such as budget, time or Council standards)?</p> <p><i>A different approach was required for this project in that the resources had to have far more business acumen than in most IT implementations. The business case for a restructuring exercise is often not clearly defined, unlike most IT implementations.</i></p> <p>Was the new Billing Project Different and in what way assuming that there are different approaches used in different circumstances ?</p> <p><i>The difference centred mainly around the definition of the business case and the difficulty in formalised planning.</i></p>
5.1.6	<p>Are some IT implementations generally more difficult to plan and budget for (in terms needing more resources and management commitment) than others ?</p> <p><i>Yes but it depends on the project and what has to be delivered and the nature of the project team.</i></p> <p>Was this the case for the New Billing Project ?</p> <p>Yes</p>

5.2 Validate Restructural Change concept :

No.	Questions
5.2.1	<p>What level and kind of planning was undertaken on this project. Outline the quality of planning in your opinion ?</p> <p><i>Broad planning of more or less the sequence of events was undertaken in this project. Detailed planning could not be undertaken as there was too many variables or unknowns. The project manager relied on a more experienced project team that only needed guidance at the highest level.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.2	<p>How much notice of the impending business changes was given by the political decision makers?</p> <ul style="list-style-type: none"> - And how was notice given? <p><i>Early notice was given but not in a lot of detail as it was provided by politicians who were generally not familiar with the detailed workings of the project.</i></p> <ul style="list-style-type: none"> - What detail of change was announced? <p><i>Very little detail was provided.</i></p> <ul style="list-style-type: none"> - Were reasons given? <p><i>Politically motivated reasons were given but not business reasons.</i></p> <ul style="list-style-type: none"> - Which reasons? <p><i>Various reasons were provided not based on council business more in line with Council politics</i></p> <ul style="list-style-type: none"> - Were they clear and did they make sense? <p><i>They were clear but not specific.</i></p> <ul style="list-style-type: none"> - Were you prepared for this announcement? How? <p><i>Not really prepared as at any stage they could have been changed before being finally ratified.</i></p>
5.2.3	<p>Apart from the Billing System were any other systems changed as a result of the Western Cape Local Government restructuring ?</p> <p><i>Yes most of the local government organisations that were effected had information systems that had to be changed to accommodate the restructuring process.</i></p>
5.2.4	<p>If more than one system was affected, did this have any impact on the New Billing System ? In terms of poolable resource allocation, such as networking staff.</p> <p><i>Yes, very specific resources are required for a project of this nature.</i></p>
5.2.5	<p>Describe, from your perspective (the interviewee) the motivation for the New Billing Project ?</p> <p><i>As explained earlier the motivation for this project was political in the sense that it was not a business need that called for the Western Cape Restructuring.</i></p>
5.2.6	<p>Would the project have been necessary, or possibly have the same importance, if Western Cape Local Government restructuring had not taken place ?</p> <p><i>No clearly not.</i></p>
5.2.7	<p>In your opinion did the billing system data have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes to include the information of the incorporated areas.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.8	<p>Could you provide some examples to support the above statement ?</p> <p><i>The inclusion of the property and other information of Pinelands, IKAPA and CMC.</i></p>
5.2.9	<p>In your opinion did the underlying billing system functionality have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes to include the business functionality of the incorporated areas.</i></p>
5.2.10	<p>Could you provide some examples to support the above statement ?</p> <p><i>The different business functionality that originated in Pinelands, IKAPA and CMC.</i></p>
5.2.11	<p>Was the time frames for this project a restricting or constraining factor and if so what made them so important ?</p> <p><i>In most circumstances the time frames were fairly strict as various none business motivated milestones were established prior to the project initiating.</i></p>
5.2.12	<p>Were any organisational changes required as a result of this project ?</p> <p><i>Yes a number of staff members were included and redeployed as a result of the restructuring exercise.</i></p>
5.2.13	<p>Specify, at what level(s) of the organisational structure, where the change occurred as a result of this project.</p> <p><i>The organisational changes were made at a number of levels from management to clerical.</i></p>
5.2.14	<p>At what level was the project sourced ie. initiated ?</p> <p><i>This project was initiated at the highest level of the organisation. The political leaders made the broad decision which was implemented by the corporate executive management.</i></p>
5.2.15	<p>Was the cost of this project higher than other IT projects, is so what were the reasons for this ?</p> <p><i>No the cost of the project was not higher.</i></p>
5.2.16	<p>Were the risks identified in not completing this project any higher than those of other IT projects and if so how ?</p> <p><i>Yes the risks were higher in that there was far more "unknowns" and other variables. Further, much needed user resources were committed to a number of different assignments.</i></p>
5.2.17	<p>Were the risks managed any differently in this project, please give examples ?</p> <p><i>The risks were managed by the need for high a high quality project team and extensive user management commitment.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.18	<p>Were there any changes in the IS Service provider as a result of this project ?</p> <p><i>Yes, as a direct result of the restructuring the IS service provider was consolidated and therefore various other supplier contracts were terminated.</i></p>
5.2.19	<p>Was there any change, that you can identify, in the IT Environment caused as a direct result of this project ?</p> <p><i>Yes, systems were moved from different environments.</i></p>
5.2.20	<p>Were there any duplicated systems ie. Were there any systems which offered the same major functionality ?</p> <p><i>Yes</i></p>
5.2.21	<p>How was the selected application system, hardware and software chosen for this project ?</p> <p>- Were the decisions made different to that of other IT implementations ?</p> <p>Examples being : Hardware and Software already existed and only one set had to be chosen to effect the Restructural change.</p> <p><i>The selected solution (hardware and software) was chosen as a result of various factors. These were traditionally based ie. on functionality as well as other specific issues. One example of a different issue is the number of users trained on a particular solution.</i></p>

5.3 Investigate the modelling of Restructural Change :

No.	Questions
5.3.1	<p>What system modelling techniques and methods were used in the new Billing Project ?</p> <p><i>Informal methods were used, these were loosely based on the SSADM and PRINCE methods.</i></p>
5.3.2	<p>Were these methods effective in modelling all aspects of the project and if not why not ?</p> <p><i>No as there were a lot of unknown elements which were difficult to model.</i></p> <p>What indications were there that make you draw your conclusions ?</p> <p><i>This project was different to many IT projects in a number of respects, this difference is what made it difficult to use mainstream modelling techniques.</i></p>
5.3.3	<p>Was the system modelling of this project different to that of other IT projects, such as a new development etc ?</p> <p><i>Yes as explained above.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.3.4	How was the aspect of change (as brought about by the restructuring exercise) modelled ? <i>This was modelled using informal techniques such as text documentation.</i>
5.3.5	List, in your opinion, the strengths of the modelling techniques used ? <i>Informal and not rigid</i>
5.3.6	List, in your opinion, the weaknesses of the modelling techniques used ? <i>Possibly did not cover all aspects of the change. Not comprehensive enough.</i>
5.3.7	Would you model or analyse this project in the same way if you had to do a similar project again ? <i>Probably would. One issue is the insistence of a good and highly skilled project team.</i>

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Detailed Questionnaire - Restructural Change

1. Interview Details

Name of Interviewee : Christie Munien Position : Senior Revenue Officer

Area of responsibility in New Billing Project : Overall responsibility of billing process.
Was seconded to the project team as the
User Assurance Co-ordinator.

2. Date: 27 September 1999

3. Purpose :

The purpose of this questionnaire is to interview various key persons involved in the implementation of the New Billing System at the City of Cape Town. This project is being used as a Case Study for research performed by Roland Amm as part of his masters dissertation.

4. Context :

The context of the questionnaire is limited to the scope of the masters dissertation which has the broad subject area of Information System (IS) Change as its focus and attempts to introduce a more specific sub-area of change referred to as “Restructural Change”.

5. Questions :

5.1 Support for the Establishment of Information System Change Categories :

No.	Questions
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5.1.1	<p>How did the New Billing System project compare to other Information Technology (IT) projects implemented at the City of Cape Town ? The comparison should be made in the following context :</p> <ul style="list-style-type: none"> - Was the project initiated any differently ? <i>Yes, Expertise had to be called from a number of different areas to form a suitable team.</i> - Were the project objectives driven mainly by business or political needs ? <i>Initially as a result of business needs re: a consolidated bill and the implementation of an effective and efficient system.</i> - Was the priority, from the user perspective, of the project more or less than similar sized IT projects ? <i>Higher as a result of Y2K and financial savings derived as a result of the migration off the mainframe.</i> - Was the project initiated from a long term strategic business plan ? <i>Yes, as defined by the Council the need for a consolidated bill existed for some twenty years.</i> - Did you notice any other differences in terms of this project being measured against other similar sized IT implementations ? <i>Yes, the timescales for this project was a lot stricter and certain deadlines had to be met.</i>
5.1.2	<p>What type of skill set was required, by the project team, for the implementation of the New Billing Project ? Were these any different to those found on most IT project teams</p> <p><i>A very good all round general knowledge of municipal business was required. This was more than normal in that business practices of the other restructured municipalities (IKAPA, CMC and Pinelands) had to be examined.</i></p>
5.1.3	<p>In your experience, are most IT projects unique and if so what makes them unique ? Does this uniqueness make a difference and was this demonstrated, in any way, during the New Billing System project ?</p> <p><i>This project was unique that it required a large amount of dedication and commitment from all involved, more so than normal. An interesting point was that in this project there was different approaches to the core business that had to be studied.</i></p>
5.1.4	<p>Have you ever tried to group the implementation of IT projects into different classes or groupings ? Using the last four IT projects as a basis for providing information and please provide details. Where would you slot in the Billing Project ?</p> <p><i>Normally are projects are grouped by the time factor involved, the volume of work and the type of people that need to get involved.</i></p>
5.1.5	<p>Are there, in your opinion, different approaches (<i>approach</i> being defined as the method or techniques in which the management and project team used to analyse, implement and test the project) to implementing IT systems depending on certain circumstances (<i>circumstance</i> being defined as any constraining factors such as budget, time or Council standards)?</p> <p><i>The approach used will depend largely on what has to be completed.</i></p> <p>Was the new Billing Project Different and in what way assuming that there are different approaches used in different circumstances ?</p> <p><i>Yes, there was a distinctively different approach used in the way that a number of business had to be studied.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.1.6	<p>Are some IT implementations generally more difficult to plan and budget for (in terms needing more resources and management commitment) than others ?</p> <p><i>No, in general they are equally difficult to plan and budget for.</i></p> <p>Was this the case for the New Billing Project ?</p> <p><i>No.</i></p>
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5.2 Validate Restructural Change concept :

No.	Questions
5.2.1	<p>What level and kind of planning was undertaken on this project. Outline the quality of planning in your opinion ?</p> <p><i>Planning was generally good and supplied in some detail.</i></p>
5.2.2	<p>How much notice of the impending business changes was given by the political decision makers?</p> <ul style="list-style-type: none">- And how was notice given? <i>Very little meaningful notice was given.</i>- What detail of change was announced? <i>The detail of the change was very high level and no detail was provided.</i>- Were reasons given? <i>No formal business reasons were given, however political (high level generic) reasoning was provided.</i>- Which reasons? <i>Mainly political issues such as a result of the restructuring municipal boundaries were demarcated differently and therefore these areas had to be included. This was not traditionally business driven ie : net profits, market share etc ..</i>- Were they clear and did they make sense? <i>They made sense from a political standpoint.</i>- Were you prepared for this announcement? How? <i>No, there was very little preparation provided for this event.</i>
5.2.3	<p>Apart from the Billing System were any other systems changed as a result of the Western Cape Local Government restructuring ?</p> <p><i>Yes, Payroll and Property Core as examples.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.4	<p>If more than one system was affected, did this have any impact on the New Billing System ? In terms of poolable resource allocation, such as networking staff.</p> <p><i>Yes, this project was also effected to a lesser extent by Y2K implementations as well.</i></p>
5.2.5	<p>Describe, from your perspective (the interviewee) the motivation for the New Billing Project ?</p> <p><i>This answer was slightly misinterpreted :</i></p> <p><i>The team was motivated due to a number of factors not least of which was the commitment from all levels of management.</i></p>
5.2.6	<p>Would the project have been necessary, or possibly have the same importance, if Western Cape Local Government restructuring had not taken place ?</p> <p><i>Yes, there were other factors such as a combined bill the necessitated this project.</i></p>
5.2.7	<p>In your opinion did the billing system data have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes, the incorporation of all the different areas seemed to indicate that it would be necessary to change the data.</i></p>
5.2.8	<p>Could you provide some examples to support the above statement ?</p> <p><i>Inclusion of CMC, IKAPA and Pinelands data.</i></p>
5.2.9	<p>In your opinion did the underlying billing system functionality have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>There was some concern expressed by the interviewee that in fact the core functionality did not have to change. After some discussion it was agreed that there was a change from the other area's perspective in that they had to now conform to the standards of the CCT.</i></p>
5.2.10	<p>Could you provide some examples to support the above statement ?</p> <p><i>Changes from the incorporated municipalities.</i></p>
5.2.11	<p>Was the time frames for this project a restricting or constraining factor and if so what made them so important ?</p> <p><i>Yes, Y2K and other financial constraints made the time factor for this project an important consideration.</i></p>
5.2.12	<p>Were any organisational changes required as a result of this project ?</p> <p><i>Yes, extensive.</i></p>
5.2.13	<p>Specify, at what level(s) of the organisational structure, where the change occurred as a result of this project.</p> <p><i>The changes occurred at all levels within the organisation.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.14	<p>At what level was the project sourced ie. initiated ?</p> <p><i>The project was sourced at the highest possible level of the organisation.</i></p>
5.2.15	<p>Was the cost of this project higher than other IT projects, is so what were the reasons for this ?</p> <p><i>No, the project was not more expensive then other projects.</i></p>
5.2.16	<p>Were the risks identified in not completing this project any higher than those of other IT projects and if so how ?</p> <p><i>The main risk to the CCT was the fact that they would have to maintain disparate billing systems. This was considered not cost effective and would have slowed the restructuring process.</i></p>
5.2.17	<p>Were the risks managed any differently in this project, please give examples ?</p> <p><i>Yes, there was a lot of team dedication in managing the risks which were individually identified and managed.</i></p>
5.2.18	<p>Were there any changes in the IS Service provider as a result of this project ?</p> <p><i>Yes, the incorporated areas were no longer supported by their IS service provider and this function was taken over by the CCT.</i></p>
5.2.19	<p>Was there any change, that you can identify, in the IT Environment caused as a direct result of this project ?</p> <p><i>There was a change for the incorporated areas.</i></p>
5.2.20	<p>Were there any duplicated systems ie. Were there any systems which offered the same major functionality ?</p> <p><i>Yes, each incorporated area had a system which offered the same billing functionality.</i></p>
5.2.21	<p>How was the selected application system, hardware and software chosen for this project ?</p> <p><i>The package selection was made purely on the force of numbers. The majority of consumers were on the CCT billing system and as a result the training and infrastructure was considered to be in place. There was no evaluation of the various system of the incorporated areas to determine which system was the most suited.</i></p> <p>- Were the decisions made different to that of other IT implementations ?</p> <p><i>Most IT implementation consider various packages on an equal footing. It is unusual that consideration be given to systems that are already established in an organisation.</i></p> <p>Examples being : Hardware and Software already existed and only one set had to be chosen to effect the Restructural change.</p>

5.3 Investigate the modelling of Restructural Change :

No.	Questions
5.3.1	<p>What system modelling techniques and methods were used in the new Billing Project ?</p> <p><i>No detailed or formalised modelling approach was used. It was agreed that the business processes established by the CCT would prevail and the incorporated areas would comply.</i></p>
5.3.2	<p>Were these methods effective in modelling all aspects of the project and if not why not ?</p> <p><i>The time constraints of the project did not allow for detailed modelling. Overall the modelling should have been done upfront before business decisions were made.</i></p> <p>What indications were there that make you draw your conclusions ?</p>
5.3.3	<p>Was the system modelling of this project different to that of other IT projects, such as a new development etc ?</p> <p><i>It was different in that the timescales were very short and had to be very adaptive as no real guidelines were given on business processes.</i></p>
5.3.4	<p>How was the aspect of change (as brought about by the restructuring exercise) modelled ?</p> <p><i>The change aspect was not modelled to well. It should have been modelled upfront prior to the implementation project. The modelling was reactive as opposed to proactive.</i></p>
5.3.5	<p>List, in your opinion, the strengths of the modelling techniques used ?</p> <p><i>Fast, uncomplicated.</i></p>
5.3.6	<p>List, in your opinion, the weaknesses of the modelling techniques used ?</p> <p><i>Not detailed enough, possible did not offer a number of options.</i></p>
5.3.7	<p>Would you model or analyse this project in the same way if you had to do a similar project again ?</p> <p><i>No sure.</i></p>

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Detailed Questionnaire - Restructural Change

1. Interview Details

Name of Interviewee : Stuart Bester

Position : City Treasurer : Pinelands
Municipality

Area of responsibility in New Billing Project :

Responsible for the day to day
management of the Pinelands
Municipality

2. **Date:** 18 October 1999

3. Purpose :

The purpose of this questionnaire is to interview various key persons involved in the implementation of the New Billing System at the City of Cape Town. This project is being used as a Case Study for research performed by Roland Amm as part of his masters dissertation.

4. Context :

The context of the questionnaire is limited to the scope of the masters dissertation which has the broad subject area of Information System (IS) Change as its focus and attempts to introduce a more specific sub-area of change referred to as "Restructural Change".

5. Questions :

5.1 Support for the Establishment of Information System Change Categories :

No.	Questions
5.1.1	<p>How did the New Billing System project compare to other Information Technology (IT) projects implemented at the City of Cape Town ? The comparison should be made in the following context :</p> <ul style="list-style-type: none"> - Was the project initiated any differently ? - Were the project objectives driven mainly by business or political needs ? - Was the priority, from the user perspective, of the project more or less than similar sized IT projects ? - Was the project initiated from a long term strategic business plan ? - Did you notice any other differences in terms of this project being measured against other similar sized IT implementations ? <p><i>As Mr Bester had not worked for the City of Cape Town, he felt he could not give accurate comparative answers, therefore this section was not completed.</i></p>
5.1.2	<p>What type of skill set was required, by the project team, for the implementation of the New Billing Project ? Were these any different to those found on most IT project teams</p> <p><i>There was a high set of skills needed from each member of the team Mr Bester could not differentiate between other IT projects for the same reason as 5.1.1.</i></p>
5.1.3	<p>In your experience, are most IT projects unique and if so what makes them unique ? Does this uniqueness make a difference and was this demonstrated, in any way, during the New Billing System project ?</p> <p><i>This project was unique and this was demonstrated by factors such as the large amount of preliminary discussion followed by a short implementation period once issues were ratified.</i></p>
5.1.4	<p>Have you ever tried to group the implementation of IT projects into different classes or groupings ? Using the last four IT projects as a basis for providing information and please provide details. Where would you slot in the Billing Project ?</p> <p><i>No, all projects are unique.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.1.5	<p>Are there, in your opinion, different approaches (<i>approach</i> being defined as the method or techniques in which the management and project team used to analyse, implement and test the project) to implementing IT systems depending on certain circumstances (<i>circumstance</i> being defined as any constraining factors such as budget, time or Council standards)?</p> <p><i>Mr Bester was not deeply involved in the overall approach, but did comment on the fact that the approach of the New Billing Project team was different.</i></p> <p>Was the New Billing Project Different and in what way assuming that there are different approaches used in different circumstances ?</p> <p><i>Yes the approach of the team was different and obviously successful.</i></p>
5.1.6	<p>Are some IT implementations generally more difficult to plan and budget for (in terms needing more resources and management commitment) than others ?</p> <p><i>Mr Bester had no part in the planning and budgeting of this project.</i></p> <p>Was this the case for the New Billing Project ?</p>

5.2 Validate Restructural Change concept :

No.	Questions
5.2.1	<p>What level and kind of planning was undertaken on this project. Outline the quality of planning in your opinion ?</p> <p><i>The planning for this project was adequate.</i></p>
5.2.2	<p>How much notice of the impending business changes was given by the political decision makers?</p> <p><i>A large amount of discussion took place at a strategic or political level, therefore operating management were reasonably well informed.</i></p> <p>- And how was notice given?</p> <p><i>The notice was given at various forums and meetings.</i></p> <p>- What detail of change was announced?</p> <p><i>There was very little detail of change given. Broad concepts were agreed in principle but the workings of how the change would take place was not provided.</i></p> <p>- Were reasons given?</p> <p><i>Yes, high level politically motivated reasons were provided.</i></p> <p>- Which reasons?</p> <p><i>The reasons focused on obtaining a more equitable municipal service by combining various structures to form a more holistic approach to municipal services.</i></p> <p>- Were they clear and did they make sense?</p> <p><i>The reasons were clear and did make sense.</i></p> <p>- Were you prepared for this announcement? How?</p> <p><i>There was a lot of high level preparation as many meetings were held as early as May 1996.</i></p>
5.2.3	<p>Apart from the Billing System were any other systems changed as a result of the Western Cape Local Government restructuring ?</p> <p><i>As far as Pinelands Municipality was concerned all systems including the main ledger, stores, wages and salaries were changed. A point was made that not all these changes were smooth and a number of systems had to be continued well after the restructuring exercise took place.</i></p>
5.2.4	<p>If more than one system was affected, did this have any impact on the New Billing System ? In terms of poolable resource allocation, such as networking staff.</p> <p><i>The logical conclusion would be that this was the case. The exact nature of this could not be quantified by Mr Bester.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.5	<p>Describe, from your perspective (the interviewee) the motivation for the New Billing Project ?</p> <p><i>The motivation for the project was to include the amalgamated areas so that a single CCT bill could be produced.</i></p>
5.2.6	<p>Would the project have been necessary, or possibly have the same importance, if Western Cape Local Government restructuring had not taken place ?</p> <p><i>No, the project was primarily driven by the Western Cape Local Government Restructuring.</i></p>
5.2.7	<p>In your opinion did the billing system data have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes, the data had to change to be incorporated with the CCT information.</i></p>
5.2.8	<p>Could you provide some examples to support the above statement ?</p> <p><i>This is demonstrated by the fact that there were certain data changes required to incorporate information into the CCT billing application system.</i></p>
5.2.9	<p>In your opinion did the underlying billing system functionality have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes, overall billing functionality remained constant but there were some slight changes.</i></p>
5.2.10	<p>Could you provide some examples to support the above statement ?</p> <p><i>Valuations, rating and service charge application was slightly different in Pinelands.</i></p>
5.2.11	<p>Was the time frames for this project a restricting or constraining factor and if so what made them so important ?</p> <p><i>Yes, for a number of reasons mainly Y2K and political pressure.</i></p>
5.2.12	<p>Were any organisational changes required as a result of this project ?</p> <p><i>Yes.</i></p>
5.2.13	<p>Specify, at what level(s) of the organisational structure, where the change occurred as a result of this project.</p> <p><i>Organisational change occurred at all levels of the organisation from senior management to clerical type workers.</i></p>
5.2.14	<p>At what level was the project sourced ie. initiated ?</p> <p><i>At the highest possible level both operationally and politically.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.15	<p>Was the cost of this project higher than other IT projects, is so what were the reasons for this ?</p> <p><i>There was no indication as to whether this project was more costly than other IT systems.</i></p>
5.2.16	<p>Were the risks identified in not completing this project any higher than those of other IT projects and if so how ?</p> <p><i>No risks were similar and there was communication with ratepayer problems.</i></p>
5.2.17	<p>Were the risks managed any differently in this project, please give examples ?</p> <p><i>No.</i></p>
5.2.18	<p>Were there any changes in the IS Service provider as a result of this project ?</p> <p><i>Yes, the DITS provided IS Services.</i></p>
5.2.19	<p>Was there any change, that you can identify, in the IT Environment caused as a direct result of this project ?</p> <p><i>There were changes in the IT Environment. The Pinelands IT Environment was amalgamated into the CCT environment.</i></p>
5.2.20	<p>Were there any duplicated systems ie. Were there any systems which offered the same major functionality ?</p> <p><i>Yes, the billing system was duplicated.</i></p>
5.2.21	<p>How was the selected application system, hardware and software chosen for this project ?</p> <p><i>There was no official choice put forward, it was agreed to incorporate the data residing in the Pinelands system into the CCT system.</i></p> <p>- Were the decisions made different to that of other IT implementations ?</p> <p>The decision was different to other IT implementations in that there was no guarantee that the best system was chosen merely the biggest.</p> <p>Examples being : Hardware and Software already existed and only one set had to be chosen to effect the Restructural change.</p>

5.3 Investigate the modelling of Restructural Change :

The user had no part in the modelling of the Restructural Change. This section was therefore not completed.

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University of Cape Town

Detailed Questionnaire - Restructural Change

1. Interview Details

Name of Interviewee : Derek Harris

Position : Director Income and Cash

Area of responsibility in New Billing Project :

Overall responsibility for the entire
Income and Cash Directorate

2. **Date:** 24 October 1999

3. Purpose :

The purpose of this questionnaire is to interview various key persons involved in the implementation of the New Billing System at the City of Cape Town. This project is being used as a Case Study for research performed by Roland Amm as part of his masters dissertation.

4. Context :

The context of the questionnaire is limited to the scope of the masters dissertation which has the broad subject area of Information System (IS) Change as its focus and attempts to introduce a more specific sub-area of change referred to as "Restructural Change".

5. Questions :

5.1 Support for the Establishment of Information System Change Categories :

No.	Questions
5.1.1	<p>How did the New Billing System project compare to other Information Technology (IT) projects implemented at the City of Cape Town ? The comparison should be made in the following context :</p> <ul style="list-style-type: none"> - Was the project initiated any differently ? <i>The project was initiated differently by virtue of the fact that due to time constraints the full Project Management methodology PRINCE was not used.</i> - Were the project objectives driven mainly by business or political needs ? <i>Both, the project was driven by a need to amalgamate certain municipalities as well as provide a consolidated bill.</i> - Was the priority, from the user perspective, of the project more or less than similar sized IT projects ? <i>The priority of the project was reasonably coupled with the fact that Y2K issues were also involved.</i> - Was the project initiated from a long term strategic business plan ? <i>No, the changes happened quickly therefore no long term strategic plan was put in place.</i> - Did you notice any other differences in terms of this project being measured against other similar sized IT implementations ? <i>No, interviewee could not say.</i>
5.1.2	<p>What type of skill set was required, by the project team, for the implementation of the New Billing Project ? Were these any different to those found on most IT project teams</p> <p><i>There was a requirement for business skills and team members who had a good understand of local government. The time frames dictated that experienced staff would be required for this type of project.</i></p>
5.1.3	<p>In your experience, are most IT projects unique and if so what makes them unique ? Does this uniqueness make a difference and was this demonstrated, in any way, during the New Billing System project ?</p> <p><i>This project was unique in that it had to be finished in certain timescales ie. By a certain date.</i></p>
5.1.4	<p>Have you ever tried to group the implementation of IT projects into different classes or groupings ? Using the last four IT projects as a basis for providing information and please provide details. Where would you slot in the Billing Project ?</p> <p><i>No, can not comment.</i></p>

5.1.5	<p>Are there, in your opinion, different approaches (<i>approach</i> being defined as the method or techniques in which the management and project team used to analyse, implement and test the project) to implementing IT systems depending on certain circumstances (<i>circumstance</i> being defined as any constraining factors such as budget, time or Council standards)?</p> <p><i>The approach and method was mainly left to the project team itself. The users did not get too involved and were essentially guided by the project team.</i></p> <p>Was the new Billing Project Different and in what way assuming that there are different approaches used in different circumstances ?</p> <p><i>There were differences mainly in the enormous commitment placed by the organisation. One difference in approach was that senior user staff were removed from current duties and placed full time on the project team.</i></p>
5.1.6	<p>Are some IT implementations generally more difficult to plan and budget for (in terms needing more resources and management commitment) than others ?</p> <p><i>The planning and costing for this project was provided by the project team. However, once those details were specified they could not have been changed.</i></p> <p>Was this the case for the New Billing Project ?</p>

5.2 Validate Restructural Change concept :

No.	Questions
5.2.1	<p>What level and kind of planning was undertaken on this project. Outline the quality of planning in your opinion ?</p> <p><i>The experience of projects undertaken prior to the New Billing was that the planning was not as rigid or the dates were not entirely fixed. With this project there was no tolerance for any change to the plan therefore the planning had to be fairly good.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.2	<p>How much notice of the impending business changes was given by the political decision makers?</p> <p><i>It was pointed out that during this tremendous change in local government a number of other factors were involved. This includes the fact that the new structure had new positions and all senior staff had to re-apply for their positions. Also at the same time the Pension fund was undergoing change making it more attractive for people to "take the package". This led to high staff turnover an example of this was 480 years of experience was lost on one day.</i></p> <ul style="list-style-type: none"> - And how was notice given? <p><i>The notice was given by political leaders to amalgamate certain areas and unbundle others.</i></p> <ul style="list-style-type: none"> - What detail of change was announced? <p><i>There was no detail.</i></p> <ul style="list-style-type: none"> - Were reasons given? <p><i>The reason given were mainly politically motivated.</i></p> <ul style="list-style-type: none"> - Which reasons? <p><i>The main reasons were to move away from the old apartheid structures of local government which were racially based and to move toward a more community oriented local government system. To make local government more economically viable.</i></p> <ul style="list-style-type: none"> - Were they clear and did they make sense? <p><i>Yes, but again not a lot of details were provided.</i></p> <ul style="list-style-type: none"> - Were you prepared for this announcement? How? <p><i>There was a logical process which was provided by the political leaders.</i></p>
5.2.3	<p>Apart from the Billing System were any other systems changed as a result of the Western Cape Local Government restructuring ?</p> <p><i>Yes, all system were effected. This included HR/Payroll, Cash Receipting, Stores etc..</i></p>
5.2.4	<p>If more than one system was affected, did this have any impact on the New Billing System ? In terms of poolable resource allocation, such as networking staff.</p> <p><i>Yes, there was a huge shortage of technical staff especially on the mainframe areas.</i></p>
5.2.5	<p>Describe, from your perspective (the interviewee) the motivation for the New Billing Project ?</p> <p><i>As mentioned earlier to provide a consolidated billing system for the newly formed structure referred to as the CCT.</i></p>
5.2.6	<p>Would the project have been necessary, or possibly have the same importance, if Western Cape Local Government restructuring had not taken place ?</p> <p><i>The project would certainly have taken place, but the amalgamation probably made the project more important.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.7	<p>In your opinion did the billing system data have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes, the billing data did change.</i></p>
5.2.8	<p>Could you provide some examples to support the above statement ?</p> <p><i>The examples revolve around the fact that the amalgamation of Pinelands and IKAPA had an impact on the overall data content.</i></p>
5.2.9	<p>In your opinion did the underlying billing system functionality have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes, certain functional changes were required.</i></p>
5.2.10	<p>Could you provide some examples to support the above statement ?</p> <p><i>Certain changes to the overall billing package was needed to accommodate the amalgamated areas.</i></p>
5.2.11	<p>Was the time frames for this project a restricting or constraining factor and if so what made them so important ?</p> <p><i>Yes, the timescales were important. The importance was driven by the need for a Y2K compliant system and the fact that some of the systems in the amalgamated areas were viewed as being dysfunctional.</i></p>
5.2.12	<p>Were any organisational changes required as a result of this project ?</p> <p><i>Yes</i></p>
5.2.13	<p>Specify, at what level(s) of the organisational structure, where the change occurred as a result of this project</p> <p><i>Organisational changes were required at all levels from senior managers who had to reapply for positions to clerical staff who were redeployed to different sections.</i></p>
5.2.14	<p>At what level was the project sourced ie. initiated ?</p> <p><i>The project was initiated at Director Level. This is the highest possible level for an operational project.</i></p>
5.2.15	<p>Was the cost of this project higher than other IT projects, is so what were the reasons for this ?</p> <p><i>No, there is no indication that this project was more or less costly then other IT projects.</i></p>
5.2.16	<p>Were the risks identified in not completing this project any higher than those of other IT projects and if so how ?</p> <p><i>There were risks with regard to Y2K issues and the potential for the amalgamated areas to be rendered dysfunctional if the project was not complete.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.17	<p>Were the risks managed any differently in this project, please give examples ?</p> <p><i>These risks were managed differently in that senior CCT staff were placed on the project on a full time basis and relieved of all other duties.</i></p>
5.2.18	<p>Were there any changes in the IS Service provider as a result of this project ?</p> <p><i>Yes, the amalgamated areas had their own IS Service provider, they were now compelled to use the CCT service provider.</i></p>
5.2.19	<p>Was there any change, that you can identify, in the IT Environment caused as a direct result of this project ?</p> <p><i>Yes, as above the IT environment was dictated by the CCT.</i></p>
5.2.20	<p>Were there any duplicated systems ie. Were there any systems which offered the same major functionality ?</p> <p><i>Each of the amalgamated areas had their own billing system, therefore there was some duplicated systems.</i></p>
5.2.21	<p>How was the selected application system, hardware and software chosen for this project ?</p> <p>- Were the decisions made different to that of other IT implementations ?</p> <p>Examples being : Hardware and Software already existed and only one set had to be chosen to effect the Restructural change.</p> <p><i>There was no real selection process. The CCT system was selected as it was the biggest system and it seemed impractical to make any other choice.</i></p>

5.3 Investigate the modelling of Restructural Change :

The user had no part in the modelling of the Restructural Change. This section was therefore not completed.

The following point was felt important :

This project was driven by the users directorate and very little input was provided by the IT division of the organisation.

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Detailed Questionnaire - Restructural Change

1. Interview Details

Name of Interviewee : Tervor Blake Position : Manager Income

Area of responsibility in New Billing Project : Overall responsibility for all Income systems

2. Date: 24 October 1999

3. Purpose :

The purpose of this questionnaire is to interview various key persons involved in the implementation of the New Billing System at the City of Cape Town. This project is being used as a Case Study for research performed by Roland Amm as part of his masters dissertation.

4. Context :

The context of the questionnaire is limited to the scope of the masters dissertation which has the broad subject area of Information System (IS) Change as its focus and attempts to introduce a more specific sub-area of change referred to as “Restructural Change”.

5. Questions :

5.1 Support for the Establishment of Information System Change Categories :

No.	Questions
5.1.1	<p>How did the New Billing System project compare to other Information Technology (IT) projects implemented at the City of Cape Town ? The comparison should be made in the following context :</p> <ul style="list-style-type: none"> - Was the project initiated any differently ? <i>The project was initiated differently by virtue of the fact that due to time constraints the full Project Management methodology PRINCE was not used.</i> - Were the project objectives driven mainly by business or political needs ? <i>Both, the project was driven by a need to amalgamate certain municipalities as well as provide a consolidated bill.</i> - Was the priority, from the user perspective, of the project more or less than similar sized IT projects ? <i>The priority of the project was reasonably coupled with the fact that Y2K issues were also involved.</i> - Was the project initiated from a long term strategic business plan ? <i>No, the changes happened quickly therefore no long term strategic plan was put in place.</i> - Did you notice any other differences in terms of this project being measured against other similar sized IT implementations ? <i>No, interviewee could not say.</i>
5.1.2	<p>What type of skill set was required, by the project team, for the implementation of the New Billing Project ? Were these any different to those found on most IT project teams</p> <p><i>There was a requirement for business skills and team members who had a good understand of local government. The time frames dictated that experienced staff would be required for this type of project.</i></p>
5.1.3	<p>In your experience, are most IT projects unique and if so what makes them unique ? Does this uniqueness make a difference and was this demonstrated, in any way, during the New Billing System project ?</p> <p><i>This project was unique in that it had to be finished in certain timescales ie. By a certain date.</i></p>
5.1.4	<p>Have you ever tried to group the implementation of IT projects into different classes or groupings ? Using the last four IT projects as a basis for providing information and please provide details. Where would you slot in the Billing Project ?</p> <p><i>No, can not comment.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.1.5	<p>Are there, in your opinion, different approaches (<i>approach</i> being defined as the method or techniques in which the management and project team used to analyse, implement and test the project) to implementing IT systems depending on certain circumstances (<i>circumstance</i> being defined as any constraining factors such as budget, time or Council standards)?</p> <p><i>The approach and method was mainly left to the project team itself. The users did not get too involved and were essentially guided by the project team.</i></p> <p>Was the new Billing Project Different and in what way assuming that there are different approaches used in different circumstances ?</p> <p><i>There were differences mainly in the enormous commitment placed by the organisation. One difference in approach was that senior user staff were removed from current duties and placed full time on the project team.</i></p>
5.1.6	<p>Are some IT implementations generally more difficult to plan and budget for (in terms needing more resources and management commitment) than others ?</p> <p><i>The planning and costing for this project was provided by the project team. However, once those details were specified they could not have been changed.</i></p> <p>Was this the case for the New Billing Project ?</p>

5.2 Validate Restructural Change concept :

No.	Questions
5.2.1	<p>What level and kind of planning was undertaken on this project. Outline the quality of planning in your opinion ?</p> <p><i>The experience of projects undertaken prior to the New Billing was that the planning was not as rigid or the dates were not entirely fixed. With this project there was no tolerance for any change to the plan therefore the planning had to be fairly good.</i></p>

5.2.2	<p>How much notice of the impending business changes was given by the political decision makers?</p> <p><i>It was pointed out that during this tremendous change in local government a number of other factors were involved. This includes the fact that the new structure had new positions and all senior staff had to re-apply for their positions. Also at the same time the Pension fund was undergoing change making it more attractive for people to "take the package". This led to high staff turnover an example of this was 480 years of experience was lost on one day.</i></p> <ul style="list-style-type: none"> - And how was notice given? <p><i>The notice was given by political leaders to amalgamate certain areas and unbundle others.</i></p> <ul style="list-style-type: none"> - What detail of change was announced? <p><i>There was no detail.</i></p> <ul style="list-style-type: none"> - Were reasons given? <p><i>The reason given were mainly politically motivated.</i></p> <ul style="list-style-type: none"> - Which reasons? <p><i>The main reasons were to move away from the old apartheid structures of local government which were racially based and to move toward a more community oriented local government system. To make local government more economically viable.</i></p> <ul style="list-style-type: none"> - Were they clear and did they make sense? <p><i>Yes, but again not a lot of details were provided.</i></p> <ul style="list-style-type: none"> - Were you prepared for this announcement? How? <p><i>There was a logical process which was provided by the political leaders.</i></p>
5.2.3	<p>Apart from the Billing System were any other systems changed as a result of the Western Cape Local Government restructuring ?</p> <p><i>Yes, all system were effected. This included HR/Payroll, Cash Receipting, Stores etc..</i></p>
5.2.4	<p>If more than one system was affected, did this have any impact on the New Billing System ? In terms of poolable resource allocation, such as networking staff.</p> <p><i>Yes, there was a huge shortage of technical staff especially on the mainframe areas.</i></p>
5.2.5	<p>Describe, from your perspective (the interviewee) the motivation for the New Billing Project ?</p> <p><i>As mentioned earlier to provide a consolidated billing system for the newly formed structure referred to as the CCT.</i></p>
5.2.6	<p>Would the project have been necessary, or possibly have the same importance, if Western Cape Local Government restructuring had not taken place ?</p> <p><i>The project would certainly have taken place, but the amalgamation probably made the project more important.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.7	<p>In your opinion did the billing system data have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes, the billing data did change.</i></p>
5.2.8	<p>Could you provide some examples to support the above statement ?</p> <p><i>The examples revolve around the fact that the amalgamation of Pinelands and IKAPA had an impact on the overall data content.</i></p>
5.2.9	<p>In your opinion did the underlying billing system functionality have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes, certain functional changes were required.</i></p>
5.2.10	<p>Could you provide some examples to support the above statement ?</p> <p><i>Certain changes to the overall billing package was needed to accommodate the amalgamated areas.</i></p>
5.2.11	<p>Was the time frames for this project a restricting or constraining factor and if so what made them so important ?</p> <p><i>Yes, the timescales were important. The importance was driven by the need for a Y2K compliant system and the fact that some of the systems in the amalgamated areas were viewed as being dysfunctional.</i></p>
5.2.12	<p>Were any organisational changes required as a result of this project ?</p> <p><i>Yes</i></p>
5.2.13	<p>Specify, at what level(s) of the organisational structure, where the change occurred as a result of this project</p> <p><i>Organisational changes were required at all levels from senior managers who had to reapply for positions to clerical staff who were redeployed to different sections.</i></p>
5.2.14	<p>At what level was the project sourced ie. initiated ?</p> <p><i>The project was initiated at Director Level. This is the highest possible level for an operational project.</i></p>
5.2.15	<p>Was the cost of this project higher than other IT projects, is so what were the reasons for this ?</p> <p><i>No, there is no indication that this project was more or less costly then other IT projects.</i></p>
5.2.16	<p>Were the risks identified in not completing this project any higher than those of other IT projects and if so how ?</p> <p><i>There were risks with regard to Y2K issues and the potential for the amalgamated areas to be rendered dysfunctional if the project was not complete.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.17	<p>Were the risks managed any differently in this project, please give examples ?</p> <p><i>These risks were managed differently in that senior CCT staff were placed on the project on a full time basis and relieved of all other duties.</i></p>
5.2.18	<p>Were there any changes in the IS Service provider as a result of this project ?</p> <p><i>Yes, the amalgamated areas had their own IS Service provider, they were now compelled to use the CCT service provider.</i></p>
5.2.19	<p>Was there any change, that you can identify, in the IT Environment caused as a direct result of this project ?</p> <p><i>Yes, as above the IT environment was dictated by the CCT.</i></p>
5.2.20	<p>Were there any duplicated systems ie. Were there any systems which offered the same major functionality ?</p> <p><i>Each of the amalgamated areas had their own billing system, therefore there was some duplicated systems.</i></p>
5.2.21	<p>How was the selected application system, hardware and software chosen for this project ?</p> <p>- Were the decisions made different to that of other IT implementations ?</p> <p>Examples being : Hardware and Software already existed and only one set had to be chosen to effect the Restructural change.</p> <p><i>There was no real selection process. The CCT system was selected as it was the biggest system and it seemed impractical to make any other choice.</i></p>

5.3 Investigate the modelling of Restructural Change :

The user had no part in the modelling of the Restructural Change. This section was therefore not completed.

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Detailed Questionnaire - Restructural Change

1. **Interview Details**

Name of Interviewee : Angus Kirkman Position : Technical Support Manager

Area of responsibility in New Billing Project : Overall responsibility for managing the technical aspects of the CCT billing system.

2. **Date:** 24/10/1999

3. **Purpose :**

The purpose of this questionnaire is to interview various key persons involved in the implementation of the New Billing System at the City of Cape Town. This project is being used as a Case Study for research performed by Roland Amm as part of his masters dissertation.

4. **Context :**

The context of the questionnaire is limited to the scope of the masters dissertation which has the broad subject area of Information System (IS) Change as its focus and attempts to introduce a more specific sub-area of change referred to as "Restructural Change".

5. Questions :

5.1 Support for the Establishment of Information System Change Categories :

No.	Questions
5.1.1	<p>How did the New Billing System project compare to other Information Technology (IT) projects implemented at the City of Cape Town ? The comparison should be made in the following context :</p> <ul style="list-style-type: none"> - Was the project initiated any differently ? <i>The project was initiated by an urgent need to achieve certain issues such as the amalgamation of local authorities and Y2K.</i> - Were the project objectives driven mainly by business or political needs ? <i>Business primarily for the consolidated bill, but also political for amalgamation.</i> - Was the priority, from the user perspective, of the project more or less than similar sized IT projects ? <i>This project was a higher priority.</i> - Was the project initiated from a long term strategic business plan ? <i>No it was fairly short term.</i> - Did you notice any other differences in terms of this project being measured against other similar sized IT implementations ? <i>Stricter time frames.</i>
5.1.2	<p>What type of skill set was required, by the project team, for the implementation of the New Billing Project ? Were these any different to those found on most IT project teams</p> <p><i>The skill set required for this project were unusually diverse. There was a strong technical component as well as business analysts and end-users. A further unusual aspect to this project was the multi streaming of tasks. The project did not follow a linear pattern of one activity following another.</i></p>
5.1.3	<p>In your experience, are most IT projects unique and if so what makes them unique ? Does this uniqueness make a difference and was this demonstrated, in any way, during the New Billing System project ?</p> <p><i>The project was unique in that it was totally out sourced.</i></p> <p><i>Another unique aspect was that the project was completed on time and within budget.</i></p>
5.1.4	<p>Have you ever tried to group the implementation of IT projects into different classes or groupings ? Using the last four IT projects as a basis for providing information and please provide details. Where would you slot in the Billing Project ?</p> <p><i>No comment</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.1.5	<p>Are there, in your opinion, different approaches (<i>approach</i> being defined as the method or techniques in which the management and project team used to analyse, implement and test the project) to implementing IT systems depending on certain circumstances (<i>circumstance</i> being defined as any constraining factors such as budget, time or Council standards)?</p> <p>Was the new Billing Project Different and in what way assuming that there are different approaches used in different circumstances ?</p> <p><i>There was a different approach used in the combination of outside consultants reporting directly to the user management with little or no intervention by the technical or IS department.</i></p> <p><i>A further difference in the approach was the non negotiable deadlines.</i></p>
5.1.6	<p>Are some IT implementations generally more difficult to plan and budget for (in terms needing more resources and management commitment) than others ?</p> <p>Yes</p> <p>Was this the case for the New Billing Project ?</p> <p><i>Yes, a number of changes were made to the project and additional or extra items added this made it difficult to planned and budget for.</i></p>

5.2 Validate Restructural Change concept :

No.	Questions
5.2.1	<p>What level and kind of planning was undertaken on this project. Outline the quality of planning in your opinion ?</p> <p><i>There was two levels of planning. The first level was high level and used to report progress.</i></p> <p><i>More detailed, yet less formal planning, was performed by the project team and used to schedule day to day work.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.2	<p>How much notice of the impending business changes was given by the political decision makers?</p> <ul style="list-style-type: none"> - And how was notice given? <i>Very little notice of the change was given.</i> - What detail of change was announced? <i>No detail was given to the technical team. The team waited for information from the business analysts and users.</i> - Were reasons given? <i>No comment.</i> - Which reasons? <i>No comment.</i> - Were they clear and did they make sense? <i>No comment.</i> - Were you prepared for this announcement? How? <i>No comment.</i>
5.2.3	<p>Apart from the Billing System were any other systems changed as a result of the Western Cape Local Government restructuring ?</p> <p><i>Yes, there was also the need, as a result of the restructuring, to extract data off the current billing system and pass it on to the South Peninsula Municipality.</i></p>
5.2.4	<p>If more than one system was affected, did this have any impact on the New Billing System ? In terms of poolable resource allocation, such as networking staff</p> <p><i>More then the different systems being impacted as a result of the restructuring exercise a number of technical support staff members were transferred to different substructures. This caused a few operational problems especially with network and operating system support.</i></p>
5.2.5	<p>Describe, from your perspective (the interviewee) the motivation for the New Billing Project ?</p> <p>There was three main motivations :</p> <ul style="list-style-type: none"> ☞ <i>Complete the original consolidation by loading electricity.</i> ☞ <i>Migration of revenue data from what was deemed to be obsolete billing systems.</i> ☞ <i>Provide a single consolidated account.</i>
5.2.6	<p>Would the project have been necessary, or possibly have the same importance, if Western Cape Local Government restructuring had not taken place ?</p> <p><i>Yes, the project would have been important possibly not as important.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.7	<p>In your opinion did the billing system data have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes, as a result of the amalgamation a number of data items were added to the data set.</i></p>
5.2.8	<p>Could you provide some examples to support the above statement ?</p> <p><i>Addition of data.</i></p>
5.2.9	<p>In your opinion did the underlying billing system functionality have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes.</i></p>
5.2.10	<p>Could you provide some examples to support the above statement ?</p> <p><i>Issues such as parked arrears from IKAPA and subtle difference in the rating approach of Pinelands did cause the ProMIS underlying functionality to change.</i></p>
5.2.11	<p>Was the time frames for this project a restricting or constraining factor and if so what made them so important ?</p> <p><i>Time scales were important and where driven by Y2K and the need for all revenue to be derived from a single system.</i></p>
5.2.12	<p>Were any organisational changes required as a result of this project ?</p> <p><i>There were three main organisational changes :</i></p> <ul style="list-style-type: none"> <i>☞ More technical or support staff were required .</i> <i>☞ Some end-users were placed full time on the project team.</i> <i>☞ Staff from other amalgamated areas were incorporated into the end user body.</i>
5.2.13	<p>Specify, at what level(s) of the organisational structure, where the change occurred as a result of this project.</p> <p><i>The change took place at all levels.</i></p>
5.2.14	<p>At what level was the project sourced ie. initiated ?</p> <p><i>Directorate level, the highest level that an operational project can get initiated.</i></p>
5.2.15	<p>Was the cost of this project higher than other IT projects, is so what were the reasons for this ?</p> <p><i>No, this project cost the same as other projects.</i></p>
5.2.16	<p>Were the risks identified in not completing this project any higher than those of other IT projects and if so how ?</p> <p><i>The risks were higher in that this project had to be completed as the indication was that the other systems were not compliant.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.17	<p>Were the risks managed any differently in this project, please give examples ?</p> <p><i>The risk was managed by forcing the data into the system. There was a make fit attitude and data that was not entirely accurate was loaded onto the system.</i></p>
5.2.18	<p>Were there any changes in the IS Service provider as a result of this project ?</p> <p><i>Yes, the supplier of IS service providers for the amalgamated areas were discontinued and the CCT supplier of IS services was used.</i></p>
5.2.19	<p>Was there any change, that you can identify, in the IT Environment caused as a direct result of this project ?</p> <p><i>Yes, there was a migration to a brand new server due mainly to the size of the data loads from amalgamated areas.</i></p>
5.2.20	<p>Were there any duplicated systems ie. Were there any systems which offered the same major functionality ?</p> <p><i>Yes, there were other billing systems however, they did not have the same functionality or level of detail.</i></p>
5.2.21	<p>How was the selected application system, hardware and software chosen for this project ?</p> <p>- Were the decisions made different to that of other IT implementations ?</p> <p>Examples being : Hardware and Software already existed and only one set had to be chosen to effect the Restructural change.</p> <p><i>The hardware and software for this project was already chosen, other additional items that were required went out to tender.</i></p>

5.3 Investigate the modelling of Restructural Change :

No.	Questions
5.3.1	<p>What system modelling techniques and methods were used in the new Billing Project ?</p> <p><i>The technical team did not model the data. They were involved with the loading. The modelling was undertaken by the business analysts and project managers.</i></p>
5.3.2	<p>Were these methods effective in modelling all aspects of the project and if not why not ?</p> <p>What indications were there that make you draw your conclusions ?</p> <p><i>The methods must have been effective as the project was completed on time and within budget.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.3.3	Was the system modelling of this project different to that of other IT projects, such as a new development etc ? <i>No further comment on modelling.</i>
5.3.4	How was the aspect of change (as brought about by the restructuring exercise) modelled ?
5.3.5	List, in your opinion, the strengths of the modelling techniques used ?
5.3.6	List, in your opinion, the weaknesses of the modelling techniques used ?
5.3.7	Would you model or analyse this project in the same way if you had to do a similar project again ?

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Detailed Questionnaire - Restructural Change

1. Interview Details

Name of Interviewee : Engela Fourie Position : Senior Clerk

Area of responsibility in New Billing Project : In charge of rates for the old Pinelands municipality.

2. Date: 29/10/1999

3. Purpose :

The purpose of this questionnaire is to interview various key persons involved in the implementation of the New Billing System at the City of Cape Town. This project is being used as a Case Study for research performed by Roland Amm as part of his masters dissertation.

4. Context :

The context of the questionnaire is limited to the scope of the masters dissertation which has the broad subject area of Information System (IS) Change as its focus and attempts to introduce a more specific sub-area of change referred to as "Restructural Change".

5. Questions :

5.1 Support for the Establishment of Information System Change Categories :

No.	Questions
5.1.1	<p>How did the New Billing System project compare to other Information Technology (IT) projects implemented at the City of Cape Town ? The comparison should be made in the following context :</p> <ul style="list-style-type: none"> - Was the project initiated any differently ? <i>No comment on how the project was initiated.</i> - Were the project objectives driven mainly by business or political needs ? <i>Political needs and some financial indications were given.</i> - Was the priority, from the user perspective, of the project more or less than similar sized IT projects ? <i>The priority of this project was high.</i> - Was the project initiated from a long term strategic business plan ? <i>No.</i> - Did you notice any other differences in terms of this project being measured against other similar sized IT implementations ?
5.1.2	<p>What type of skill set was required, by the project team, for the implementation of the New Billing Project ? Were these any different to those found on most IT project teams</p> <p><i>The project team seemed to be of a higher standard and required a much better business knowledge.</i></p>
5.1.3	<p>In your experience, are most IT projects unique and if so what makes them unique ? Does this uniqueness make a difference and was this demonstrated, in any way, during the New Billing System project ?</p> <p><i>Most IT projects are similar.</i></p>
5.1.4	<p>Have you ever tried to group the implementation of IT projects into different classes or groupings ? Using the last four IT projects as a basis for providing information and please provide details. Where would you slot in the Billing Project ?</p> <p><i>Cannot comment.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.1.5	<p>Are there, in your opinion, different approaches (<i>approach</i> being defined as the method or techniques in which the management and project team used to analyse, implement and test the project) to implementing IT systems depending on certain circumstances (<i>circumstance</i> being defined as any constraining factors such as budget, time or Council standards)?</p> <p>Was the new Billing Project Different and in what way assuming that there are different approaches used in different circumstances ?</p> <p><i>The approach used by this project team was more professional and there was a lot more pressure to get the job completed correctly.</i></p>
5.1.6	<p>Are some IT implementations generally more difficult to plan and budget for (in terms needing more resources and management commitment) than others ?</p> <p>Was this the case for the New Billing Project ?</p> <p><i>Cannot comment.</i></p>

5.2 Validate Restructural Change concept :

No.	Questions
5.2.1	<p>What level and kind of planning was undertaken on this project. Outline the quality of planning in your opinion ?</p> <p><i>There was a high level of planning and it seemed to be of good quality due to the fact that the established milestones were reached.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.2	<p>How much notice of the impending business changes was given by the political decision makers?</p> <p>- And how was notice given?</p> <p>The staff of the amalgamated areas felt that they were badly informed and that it was a “take over” more then an amalgamation.</p> <p>- What detail of change was announced?</p> <p><i>There was little of no detail given to the staff of the amalgamated areas.</i></p> <p>- Were reasons given?</p> <p><i>Yes, some reason were given.</i></p> <p>- Which reasons?</p> <p><i>The major reasons for the change was understood as municipal boundary changes.</i></p> <p>- Were they clear and did they make sense?</p> <p><i>Yes, the reasons were clear.</i></p> <p>- Were you prepared for this announcement? How?</p> <p><i>No, the staff at Pinelands were not really prepared for the announcement.</i></p>
5.2.3	<p>Apart from the Billing System were any other systems changed as a result of the Western Cape Local Government restructuring ?</p> <p><i>Other systems were supposed to change, but they took a long time.</i></p>
5.2.4	<p>If more than one system was affected, did this have any impact on the New Billing System ? In terms of poolable resource allocation, such as networking staff</p> <p><i>Not really.</i></p>
5.2.5	<p>Describe, from your perspective (the interviewee) the motivation for the New Billing Project ?</p> <p><i>There was a need for a consolidated Cape Town bill which would be more cost effective.</i></p>
5.2.6	<p>Would the project have been necessary, or possibly have the same importance, if Western Cape Local Government restructuring had not taken place ?</p> <p><i>No, the project would not have taken place.</i></p>
5.2.7	<p>In your opinion did the billing system data have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p><i>Yes.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.8	<p>Could you provide some examples to support the above statement ?</p> <p><i>The data required by the CCT billing system ProMIS required more content then what was held in Pinelands.</i></p>
5.2.9	<p>In your opinion did the underlying billing system functionality have to change in any way to accommodate or as a result of the New Billing Project ?</p> <p>Yes.</p>
5.2.10	<p>Could you provide some examples to support the above statement ?</p> <p><i>The way in which rates were calculated in Pinelands differed to that of CCT. Also a different general valuation (GV) year was used to calculate the rates value.</i></p>
5.2.11	<p>Was the time frames for this project a restricting or constraining factor and if so what made them so important ?</p> <p><i>Yes the time frames were important. The main constraining factor was the fact that the interim valuations had to be completed once the data was migrated to ProMIS.</i></p>
5.2.12	<p>Were any organisational changes required as a result of this project ?</p> <p>Yes.</p>
5.2.13	<p>Specify, at what level(s) of the organisational structure, where the change occurred as a result of this project.</p> <p><i>Organisational changes were undertaken at all levels of the organisation.</i></p>
5.2.14	<p>At what level was the project sourced ie. initiated ?</p> <p><i>Top management.</i></p>
5.2.15	<p>Was the cost of this project higher than other IT projects, is so what were the reasons for this ?</p> <p><i>There was no indication as to whether this project was more or less expensive.</i></p>
5.2.16	<p>Were the risks identified in not completing this project any higher than those of other IT projects and if so how ?</p> <p><i>There was some risk in that the ratepayers were to be billed monthly and any delays in the take on would negatively effect the billing.</i></p>
5.2.17	<p>Were the risks managed any differently in this project, please give examples ?</p> <p><i>No comment.</i></p>
5.2.18	<p>Were there any changes in the IS Service provider as a result of this project ?</p> <p><i>Yes, the original service provider was the Parow Municipality Bureau. This was replaced by the CCT service provider.</i></p>

RESTRUCTURAL INFORMATION SYSTEM CHANGE

5.2.19	<p>Was there any change, that you can identify, in the IT Environment caused as a direct result of this project ?</p> <p><i>Yes, all equipment and IT infrastructure changed to conform to the standards specified by the CCT.</i></p>
5.2.20	<p>Were there any duplicated systems ie. Were there any systems which offered the same major functionality ?</p> <p><i>Yes. The billing systems.</i></p>
5.2.21	<p>How was the selected application system, hardware and software chosen for this project ?</p> <p>- Were the decisions made different to that of other IT implementations ?</p> <p>Examples being : Hardware and Software already existed and only one set had to be chosen to effect the Restructural change.</p> <p><i>There was no selection process. It was already decided.</i></p>

5.3 Investigate the modelling of Restructural Change :

The user had no part in the modelling of the Restructural Change. This section was therefore not completed.

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